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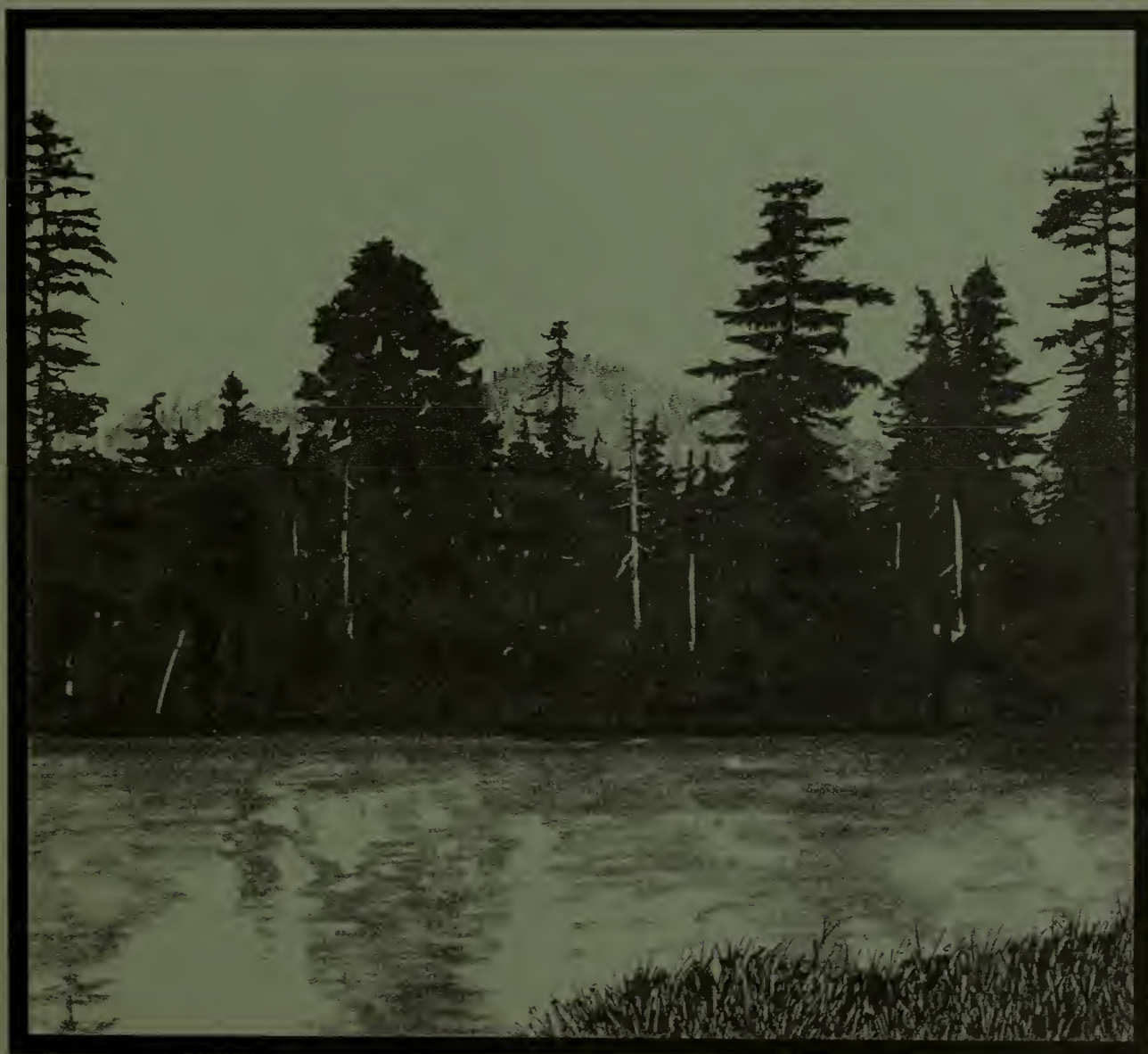


Control Lake Timber Sale

Draft Environmental Impact Statement

Volume II

Appendices A, B, C, D, E, G, and H



Appendix A

Reasons for Scheduling the Environmental Analysis of the Control Lake Project Area

Reasons For Scheduling The Environmental Analysis Of The Control Lake Project Area

KPC Long-term Timber Sale Contract Offerings

This appendix explains why the Control Lake Project Area is scheduled for environmental analysis at this time.

Summary

Reasons for scheduling the Control Lake Project Area at this time, for detailed consideration of timber harvest under the Ketchikan Pulp Company Long-term Timber Sale Contract, may be summarized as follows:

1. The Control Lake Project Area is within the designated sale area for the Ketchikan Pulp Company Long-term Timber Sale Contract, and contains a sufficient amount of harvestable timber volume designated as LUD III or IV, and therefore appropriate for harvest under the Tongass National Forest Land Management Plan (TLMP). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with Forest Plan Standards and Guidelines and other requirements for resource protection.
2. Areas with available timber inside and outside the designated sale area will be necessary for harvest within the remainder of the Ketchikan Pulp Company Contract term (by 2004) in order to meet contract volume requirements. Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas on the Tongass National Forest with available timber is expected to have similar potential effects on resources, including those used for subsistence because of widespread distribution of subsistence use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under either the existing or proposed revised Forest Plan.
3. Providing substantially less timber volume than required by the Ketchikan Pulp Company Contract in order to avoid harvest in the Control Lake Project Area or other project areas would not meet contract requirements and is otherwise not necessary or reasonable.
4. It is reasonable to schedule harvest in the Control Lake Project Area at present rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence and other effects, and the ability to complete the National Environmental Policy Act (NEPA) process and make timber available to meet contract requirements by the time it is reasonably necessary to do so. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.

More detail regarding the scheduling of the environmental analysis for the Control Lake Project Area is presented in this appendix in three subsections:

Ketchikan Pulp Company Contract Requirements

Contract Background

In 1951, the Forest Service and Ketchikan Pulp Company (APC) entered into a contract for sale and harvest of timber in Southeast Alaska for a 50-year period beginning in 1954 and ending in 2004. A primary function of this long-term contract was to "establish a new industrial enterprise which will be an important and significant step in the industrial development of Alaska" (Forest Service 1956).

The current management situation consists of a valid contract between the Forest Service and KPC, contract number A10fs-1042. This contract bestows rights and obligations on both parties. One obligation for the Forest Service is to provide the agreed upon volume from an identified contract sale area on the Tongass National Forest. Contract section B0.62 states in part "Forest Service shall seek to specify sufficient Offerings to maintain a Current Timber Supply in all Offering Areas that total at least three years of operations hereunder or until the contract termination date, whichever comes first, and which meets the the production requirements of Purchaser's manufacturing facilities."

"Current Timber Supply" is defined in the contract generally as timber which the Forest Service has specified according to Forest Service planning procedures and for which the NEPA process has been completed. The Forest Service specifies timber through approving in writing a timber "Offering" under the contract, comparable to an independent timber sale. This approval in writing is represented by issuance of an "A Division" contract document for the Offering. An EIS such as the Control Lake Project Area EIS may cover one or up to several such Offerings, which may be specified by the Forest Service and therefore added to the contract "Current Timber Supply" concurrently or sequentially after issuance of the Record of Decision for the Project. Generally, layout on the ground of roads and harvest units selected in the Record of Decision (ROD) will be completed for each Offering prior to issuance of the "A Division" approval document.

The Forest Service Timber Sale Preparation Handbook (FSH 2409.18 Chapter 10) details the process utilized to prepare timber sales. This process also guides the preparation of timber Offerings under the KPC Contract. The timber sale preparation process is summarized below. Included in brackets is information describing modifications to the process specific to the KPC Contract. The Handbook states:

The timber sale preparation process begins with the identification of the sale area and ends with the award of the timber sale contract [as described above, the process for the KPC Contract ends with the issuance of an "A Division" contract document for the Offering]. These activities pass through specific stages, called "gates", each of which requires specific outputs before proceeding to the next gate. . . Following are descriptions of work processes at each gate.

Gate 1. Begin sale preparation activities with scoping or position statement development. Identify the purpose and need for the project, public issues, interested outside parties, management issues, resource opportunities in the

sale area, a range of possible volume targets, and initial transportation system needs. . .

Gate 2. During the sale area design (environmental analysis) phase, develop alternative designs and analyze them for environmental effects. Concurrently, develop an analysis file to store the information that is gathered. Once a course of action is selected, develop a sale implementation plan that provides detailed instructions for field layout of all sale elements. The end product of the sale area design phase is the selection of the preferred alternative and signature of the decision notice by the official authorized to approve the project. . .

Gate 3. Activities leading to sale plan implementation include the data gathering and the on-the-ground marking, designating, and delineating needed to properly support the appraisal, the preparation of the contract, and post-award sale administration efforts. The sale passes through gate 3 when the field work is completed. . .

Gate 4. After gathering all necessary engineering design work, cruise (volume) information, logging costs, environmental protection costs, and other elements of the timber appraisal. . . [a final timber appraisal is prepared for the offering(s) and an "A Division" contract document is issued].

Contract provisions require KPC to harvest timber, construct and operate a mill for primary manufacture and to recruit labor from residents of Southeast Alaska. To fulfill this obligation KPC operates a sawmill and a pulp mill in Ketchikan and a sawmill in Metlakatla.

Section B0.61 of the Contract, *Timber Offering Schedule*, provides in part:

"To the extent authorized by law, Offering Areas may be identified for harvest outside the sale area, as needed to meet sale volume requirements."

The Control Lake Project Area lies within the "sale area".

Providing volume outside of the sale area is necessary at this time under the terms of the contract. Although KPC has indicated that the Forest Service has the discretion to consider obtaining volume from outside the designated sale area, it has not expressed an interest obtaining timber from other areas in lieu of the Control Lake Project Area. The criteria for modification in 36 CFR 223.112,113 have not been met, considering the information in the TLMP SDEIS, and this EIS. Congress in enacting the Tongass Timber Reform Act declined to modify the contract sale area, and by directing in section 301(e) of the statute that the Secretary of Agriculture report to Congress on the effects of eliminating the sale area, indicated an intent to reserve this decision to the legislature.

Why Providing Less Than The Contract Volume Was Not Considered In Detail

Congress in section 301(e) of the TTRA also indicated its intent to reserve to itself the question of providing less than the contract volume obligation to KPC. Less than the contract volume would not meet the purpose and need for the Control Lake Project. The Forest Service can expect a large monetary claim from KPC for not meeting contract volume obligations, for which there is no current funding. To the contrary, recent federal appropriations legislation has dedicated additional money to providing additional timber offerings to KPC and other Tongass National Forest timber purchasers. Volume from

independent timber sales or sources outside the Tongass National Forest do not fulfill KPC Contract requirements. In any case, there is not sufficient projected volume from other sources to meet KPC volume requirements.

Logs from Native Company lands cannot substantially meet the total needs of KPC. Owners of private timberland are able to sell their sawlogs on the export market for much higher prices than can be paid by local manufacturing. KPC is not prohibited under the Contract from purchasing timber from Native Companies or other sources, subject to the requirement that, ". . . at least three-fourths of the pulpwood requirements of the pulp manufacturing plant and other processing facilities operated in conjunction with this sale shall be cut from the areas covered by this agreement during the period prior to July 1, 1964, and during each 5-year operating period subsequent to that date. " (KPC contract B0.53). There are no provisions in the Contract to offset such purchases by adjusting the Contract timber volume. Harvest from Native Company lands is decreasing, reducing potential pulp as well as sawlog availability from these lands (TLMP SDEIS page 3-339).

Canadian timber has been mentioned in the past as a source of supply for Southeast mills. Southeast Alaska pulp mills have purchased pulp logs from British Columbia (BC) in the past. However, the political and economic situation in British Columbia has changed to decrease the likelihood of substantial supply from this source. The June 1988 issue of British Columbia Lumberman, page W14, states that a substantial increase in demand for BC forest products is expected to decrease log exports. The Forest Minister stated: "Our main objective is to use BC timber to manufacture wood products in this province." It has been more recently stated that British Columbia is considering prohibiting log exports and is facing increased environmental pressures (TLMP SDEIS, page 3-339).

Trying to meet the long-term volume contractual obligations from outside the long-term timber sale boundaries would decrease the availability of timber for the independent timber sale program, including the Small Business Set Aside Program; obtaining a substantial portion of long-term contract timber from outside the designated sale areas would probably decrease the independent sale program by an equivalent amount under the current TLMP allowable sale quantity. Under the current Plan, an annual average of 271 MMBF net sawlog of the ASQ is needed to meet the long-term sale requirements, leaving an annual average of 179 MMBF net sawlog for the independent program.

The TLMP SDEIS (table 3-134, page 3-368) shows for the current Plan as amended by the TTRA (Alternative C) the contribution to ASQ net sawlog (MMBF) by Allotment Area. Contingency Areas of Allotment E, F, and G of the KPC contract area contribute 125 MMBF annual average (28%) to the ASQ. Designating any part of this volume for the long-term sale could directly reduce the portion of the ASQ available for the independent program. The timber volume included in the action alternatives in the Control Lake Project EIS and scheduled from this area in the TLMP for the long-term contract could affect the Small Business Administration timber sale program agreed to with the SBA of 80 MMBF. Section 105 of the Tongass Timber Reform Act reflects Congressional intent that the SBA program continue.

Lack of an adequate timber supply to support these programs could affect the existing mill infrastructures and employment. The TLMP SDEIS (table 3-118, page 3-337) shows that lumber mill capacity for independent operators is about 220 MMBF annually (380 MMBF minus the Wrangell and KPC Sawmills). During good market conditions, the short term sales program has purchased up to 174 MMBF and harvested up to 149 MMBF annually which translates into about 67 percent of the mill capacity (TLMP SDEIS, table 3-114, page 3-325). Therefore, under good market conditions, the existing infrastructure can absorb the available supply. Elimination of short term sales under the independent

and set-aside programs would translate into a loss of between 815 and 1144 timber-related jobs (TLMP SDEIS page 3-370, 3-610).

Current Timber Supply And Volume Needs

Any Ketchikan Pulp Company (KPC) long-term contract offerings implemented through this Project will help meet KPC long-term contract timber supply needs. The KPC timber sale contract (USDA Forest Service, 1951, Contract Number A10fs-1042), includes the following provisions:

B0.61 Timber Offering Schedule. Each year prior to February 15, Forest Service after consultation with purchaser shall develop a tentative Offering schedule based upon the Tongass National Forest Land and Resource Management Plan, which shall display Offering Areas and timber volumes proposed for harvest, and the expected NEPA process commencement and completion date for making any additional Offerings under the terms of this contract. To the extent authorized by law, Offering Areas may be identified for harvest outside the Sale Area, as needed to meet sale volume requirements. The tentative schedule shall list sufficient timber volume and schedule commencement of the NEPA process by Offering Area or Areas to provide Purchaser a Current Timber Supply sufficient for at least three years of operations hereunder or until the contract termination date, whichever occurs first, adjusting for the provisions of B0.63 and B6.36. In developing the schedule, Forest Service will consider the production requirements of Purchaser's manufacturing facilities.

B0.62 Specifying Offerings for Harvest. Based upon the tentative schedule and NEPA process, and consistent with timber sale planning, management requirements, and environmental assessment procedures for independent Tongass National Forest timber sales, Forest Service after consultation with Purchaser and completion of the NEPA process, shall specify any additional Offerings. Forest Service shall seek to specify sufficient Offerings to maintain a Current Timber Supply in all Offering Areas that totals at least three years of operations hereunder or until the contract termination date, whichever occurs first, and which meets the production requirements of Purchaser's manufacturing facilities.

The maximum average annual rate per year at which KPC is generally allowed to harvest is 192.5 MMBF under long term contract section B0.52. KPC's average harvest rate, obtained from contract records, during the five-year period from March 1, 1989 through February 28, 1994 was 185.4 MMBF per year. Therefore, a three year supply of timber for KPC's operations under the contract is currently estimated to range from 556.2 to 577.5 MMBF.

As of June 1, 1995, KPC had a current timber supply of approximately 193 MMBF. The maximum volume of timber that can be provided to KPC from within the contract area in the remainder of fiscal year 1995 is about 93 MMBF. The maximum amount that can be provided to KPC from within the contract area during 1996 is expected to be about 174.1 and during 1997 about 155.9 MMBF. Assuming the maximum annual average harvest rate of 192.5 MMBF, a timber supply of 93.5 MMBF would be available at the end of 1995, 75.1 MMBF at the end of 1996, and 38.5 MMBF at the end of 1997. These levels would fall well short of meeting the objective of specifying a three-year supply for operations under the contract, considering on-going harvest at either the maximum or historic rates noted above.

There have been suggestions that layout and other actions could be expedited to increase the amounts available from the contract area through 1997. However the current assessment is that further expediting layout is not feasible, even with significant increased funding, while maintaining a reasonable assurance of quality work. The Forest Service has made efforts to accelerate the preparation of new offerings within the contract area. At present, about 852.7 MMBF in new timber projects are being planned within the contract area over the duration of the contract, beyond what is projected in the 1995 - 1997 figures presented above. However, because of the amount of time required to prepare new offerings in accordance with applicable laws, none of this volume is projected to be available until after fiscal year 1997. It remains to be seen how much of the volume in preparation will be cleared through the NEPA process and when it will be available.

Consequently, additional timber from outside the KPC contract area is needed in order to meet the three-year timber supply objective. Sale offerings currently scheduled, undergoing NEPA evaluation, or at some other stage in the preparation process are projected to be needed to help meet the KPC long-term contract and independent sale program's three-year supply objectives. If any currently planned independent sales were converted to KPC contract offerings, equivalent volume currently planned for KPC contract offerings would then need to be substituted as independent sale offerings. The first offerings from the Control Lake Project Area could be made available in 1997 to help meet either three-year supply objective.

Tongass Land Management Plan

TLMP As Amended Winter 1985-86

Chapter 1 of this EIS includes an explanation of how this project relates to the Tongass Land Management Plan. That section describes the Land Use Designations (LUDs) which allocate land areas to different types of management. Chapter 1 also explains that these LUDs were assigned to land areas known as Value Comparison Units (VCUs), and that one or more contiguous VCUs were formed into Management Areas (MAs). This section also describes the management emphasis for the Management Areas likely to be affected by the Control Lake Project.

The Tongass Land Management Plan, As Amended Winter 1985-1986, not only detailed Management Direction/Emphasis for each Management Area, it also scheduled specific Management Activities for specific time periods. In particular it scheduled timber sale preparation activities for 1985-89 and 1990-94. Table 2 displays the Management Areas scheduled for timber sale preparation during 1990-94.

Table 1
TLMP, As Amended Winter 1985-86, Activity Schedule

Management Area	Name	Years Scheduled	Activity Scheduled
K08	Honker-Sweetwater	90-94	Timber Sale Prep
K14	Craig	90-94	Timber Sale Prep
K15	Control	90-94	Timber Sale Prep

The Allowable Sale Quantity (ASQ), calculated in TLMP and used in Congressional deliberations and decisions on ANILCA, assumed harvest in all LUD III and LUD IV VCU's, in compliance with the Southeast Area Guide, on a three entry, 100 year rotation. Some selected areas were scheduled for 4 entries in 120 years (LUD IV) and 6 entries in 200 years (LUD III) for visual considerations. A three entry rotation assumes the first entry will be made within 30 to 40 years. If areas are not entered, and the ASQ is harvested, other areas will have to receive a heavier entry, resulting in a pattern of high percentage first entries being established, and therefore creating conditions under which the three-entry rotation may not be achievable.

The TLMP as amended also scheduled as anticipated management outputs from the Ketchikan Area timber volume ranging from 195.0 million to 220.3 million annually (Tongass Land Management Plan Amended Winter 1985-86, page 5).

Supplemental TLMP Revision Draft EIS (TLMP SDEIS)

1. Sufficient Volume for KPC Contract Needs in TLMP SDEIS.

The TLMP SDEIS Chapter 3 section on timber (pages 3-354 and 355) provides the following summary statements in terms of the timber supply and the long-term timber sale programs.

If utility volume is included, Alternatives B, C, D, and P would meet or exceed the projected demand for National Forest timber (400 MMBF). Alternative A would provide 89 percent of the projected demand.

All of the first-decade Allowable Sale Quantity (ASQ, sawlog) in Alternative A would be needed to satisfy the long-term contracts; Alternative B would need 82 percent of the ASQ; Alternative C, 69 percent; Alternative D, 66 percent; and Alternative P, 75 percent.

These statements show that timber supply exceeds the level which is required to satisfy the long-term timber sale contracts (both APC and KPC). The data to support these statements is displayed in table 3-127 on page 3-355 and table 3-135 on page 3-371 of TLMP SDEIS. Table 3-135, in particular, shows the Long-Term and Short-Term Sales program volumes for the decade.

TLMP SDEIS also presents a discussion of timber supply within the KPC long-term contract sale area. As of October 1990 (the date of the TLMP SDEIS analysis), the remaining KPC Long-term Timber Sale Contract volume requirement was 2,443 MMBF, including utility (TLMP SDEIS, table 3-116, page 3-329, table 3-133, page 3-366). TLMP SDEIS alternatives A, B, C, D, and P provide, respectively, 3,800 MMBF, 4,180 MMBF, 5,930 MMBF, 5,920 MMBF and 5,480 MMBF, including utility, from the KPC designated sale area (allotments E, F, and G (TLMP SDEIS, table 3-133, page 3-366). So the all alternatives in the TLMP SDEIS indicates more than sufficient timber remaining available in the designated KPC sale area to meet remaining contract volume requirements, consistent with resource protection requirements and other constraints projected in the document.

Analysis in TLMP SDEIS is related to suitable-available acres. These are acres of forest that are identified as suitable for timber harvest and which are assigned management prescriptions within the TLMP SDEIS that allow consideration of timber harvest. For each alternative, TLMP SDEIS analysis confirms that the identified suitable-available acres contain more than enough potentially available timber within the sale area to meet the remaining volume commitment. These figures appear in table 3-134, pages 3-368 and 3-369, TLMP SDEIS and are summarized in the following table.

Table 2
Timber Volume Available Within The Contract Area

Alt.	Allotment Area	Suitable-Available (Acres)	Old Growth Standing Vol (MMBF)
A	E-Primary	141,194	2,098
	F-Primary	38,960	698
	G-Primary	101,493	1,499
	Rest of E	39,166	826
	Rest of F	129,743	2,891
	Rest of G	157,426	2,806
		-----	-----
		607,982	10,818
B	E-Primary	154,484	2,408
	F-Primary	42,193	793
	G-Primary	122,586	1,868
	Rest of E	45,926	984
	Rest of F	147,347	3,291
	Rest of G	153,245	2,678
		-----	-----
		665,781	12,022
C	E-Primary	169,584	2,772
	F-Primary	47,769	915
	G-Primary	139,423	2,223
	Rest of E	75,551	1,702
	Rest of F	234,232	5,367
	Rest of G	227,707	4,407
		-----	-----
		894,266	17,386
D	E-Primary	179,257	2,931
	F-Primary	49,889	939
	G-Primary	145,925	2,356
	Rest of E	47,065	1,010
	Rest of F	213,401	4,853
	Rest of G	240,790	4,676
		-----	-----
		876,327	16,765
P	E-Primary	161,578	2,586
	F-Primary	45,262	859
	G-Primary	135,737	1,401
	Rest of E	65,954	1,462
	Rest of F	217,768	4,981
	Rest of G	199,856	3,809
		-----	-----
		826,155	15,098

Furthermore, TLMP SDEIS displays the number of acres of tentatively suitable lands that are scheduled to be harvested over the planning horizon for each Management Area (TLMP SDEIS, table 3-138, page 3-378). This table indicates that the scheduling of the Control Lake Project Area and other project areas within the KPC sale area to meet contract volume requirements over the next several years is anticipated. In addition, this table shows that there are adequate suitable acres in these Management Areas, scheduled to be harvested, to provide that volume. A portion of table 3-138 is displayed below in table 4. It displays, for Alternative P, the scheduled suitable acres by Management Area. Table 4 is similar to table 2 which showed the Management Areas scheduled for timber sale preparation during 1991-95. A comparison of these two tables indicates that the Management Areas identified as appropriate for timber harvest activities in the existing TLMP (as amended winter 1985-86) are also identified as appropriate in alternative P of TLMP SDEIS.

Table 3
TLMP SDEIS Alternative P Scheduled Acres (selected Management Areas)

Mgmt. Area	Name	Acres Sched- uled	Percent Of MA	Total MA Acres
K08	Honker-Sweet.	57,310	46.3	123,835
K14	Craig	37,844	27.6	137,130
K15	Control	21,440	40.2	53,328

2. Cumulative Effects

The TLMP SDEIS considers the cumulative effects for forest-wide acres managed for timber production for both the long-term and short-term timber sale programs. These effects are discussed on pages 3-371 through 3-381. Cumulative effects for other resources are discussed at the end of their respective sections.

Analysis points to the need to schedule harvest in VCUs assigned management prescriptions which permit consideration of timber harvest, including the VCUs within the Control Lake Project Area. These VCUs in the current Forest plan, and in the draft revised Forest Plan would be needed to help meet the Tongass National Forest Allowable Sale Quantity, and also the contractual timber volume needs for the KPC Long-term Timber Sale. The forest-wide cumulative effects analysis in the TLMP SDEIS supports the conclusion that this harvest can be accomplished within existing and proposed revised TLMP standards and guidelines and other requirements for resource protection.

3. Subsistence

With the passage of the ANILCA, Congress recognized the importance of subsistence resources to rural residents of Alaska. In particular, prior to any disposition of public lands, an agency must first complete a subsistence effects evaluation, including consideration of the availability of other lands (ANILCA 810 (a)).

Based on a review of available harvest volumes for each VCU in the KPC contract area, it appeared that in order to meet contract volume commitments, most of the LUD III and IV VCUs would need some level of harvest prior to the end of the KPC contract in 2004. A tentative offering schedule was developed and approved for implementation based on this analysis. In short, almost all LUD III and IV VCUs in the KPC Long-term Sale would be scheduled for harvest within the next 10 to 15 years, indicating a level of impact to all subsistence use areas. However, the most significant impacts on the subsistence resource habitat would not occur until 20 to 30 years after the timber harvest when the second growth canopy closes. When those impacts to subsistence resources are viewed from a reference point 20 years in the future, the particular importance of which areas are scheduled first during a 5-year period appears to be minor.

In considering communities that may be most affected by any proposed timber harvest in the Control Lake Project Area, Coffman Cove, Craig, Hollis, Hydaburg, Klawock and Naukati appear to have the strongest cultural and subsistence ties to the area. Each community has its own level of reliance on subsistence as well as its own level of reliance on the Control Lake Project Area for supplying subsistence resources. The following information about each communities subsistence use is a summary of more detailed information provided in chapters 3 and 4 of the Control Lake Project EIS.

Coffman Cove Areas adjacent to the road system and in the immediate vicinity of Coffman Cove are some of the major subsistence use areas for the community. Relatively little use of the Project Area is made by the residents of Coffman Cove.

Craig Areas adjacent to the road system and those accessed by boat in the southwest portion of the Project Area are some of the major subsistence use areas within the project area. Approximately fifty percent of Craig's deer came from the Project Area WAA's between 1987 and 1990. Preliminary analysis shows that there is an adequate number of deer to meet the current subsistence and sporthunting demand for deer now, however, it may be necessary to restrict the sport harvest of deer in the future.

Hollis Fourteen percent of Hollis's deer came from the Project Area WAA's between 1987 and 1990. Preliminary analysis shows that there is an adequate number of deer to meet the current subsistence demand for deer now, however, it may be necessary to restrict the sport harvest of deer in the future.

Hydaburg Eighteen percent of Hydaburg's deer came from the Project Area WAA's between 1987 and 1990. Preliminary analysis shows that there is an adequate number of deer to meet the current subsistence and sporthunting demand for deer now, however, it may be necessary to restrict the sport harvest of deer in the future.

Klawock Subsistence harvest methods within the community of Klawock have been changing since the road tie with Hollis was made in 1984. Prior to that time subsistence harvest was mostly tied to boating activities. The community places high importance on the southwest portion of the Project Area for traditional and cultural subsistence values. Sixty-six percent of Klawock's deer came from the Project Area WAA's between 1987 and 1990. Preliminary analysis shows that there is an adequate number of deer to meet the current subsistence demand for deer now, however, it may be necessary to restrict the sport harvest of deer in the future.

As a result of several considerations, including the availability of subsistence resources in undisturbed areas of Prince of Wales Island, including LUD I and LUD II areas within or adjacent to the Project Area (such as the Karta Wilderness), the relative independence of most communities from subsistence resources in the Project Area, as well as analysis

contained in the Tongass Land Management Plan SDEIS, the Forest Service determined to schedule an environmental analysis of the Control Lake area. Other projects including Central Prince of Wales, Lab Bay, North Revilla, Port Stewart, Vixen Inlet, Upper Carroll, Ratz Harbor, Heceta Island, Chasina, and Sea Level are being implemented, or, will undergo environmental analysis within the next 3 to 5 years.

Extensive forestwide cumulative effect analysis has been included in the TLMP SDEIS (TLMP SDEIS pages 3-628 through 3-765). That analysis, and the tables of data shown in appendix K of TLMP SDEIS are incorporated by reference into this document. The data in appendix K and L indicates subsistence hunting of deer and other uses in virtually every area of the Tongass with substantial quantities of harvestable timber. The following information is extracted directly out of the Tongass Land Management Plan Revision, Supplement to the Draft Environmental Impact Statement, pages 3-762 and 3-763:

In conducting the subsistence evaluation it is determined that, in combination with other past present and reasonably foreseeable future actions, none of the alternatives would pose a significant possibility of significant restriction for salmon, other finfish, marine mammals, invertebrates, plants, mountain goat, moose, waterfowl, sea birds, or other small game. Together these resources account for an average of 79 percent of the total harvest of subsistence resources (Kruse and Muth, 1990).

In considering the impacts of future actions that may take place under the proposed alternatives on deer, two types of analysis was conducted. Potential effects were first determined for those WAAs where residents have successfully harvested deer, then for those WAAs where residents have ever gone to harvest deer. Both 10 percent and 20 percent harvest levels of the deer population were used.

Considering only those WAAs where residents successfully harvested deer and assuming a harvest level of 10 percent of the population, there would be sufficient deer in all alternatives for the next 50 years to meet all subsistence needs for all communities except Gustavus, Hoonah, Kake, Pelican, Sitka, and Yakutat (appendix K). For these communities, there would be insufficient habitat capability to support harvest by all subsistence users (regardless of the community of origin). However, at 20 percent of the population, all subsistence needs for these communities would be met by all alternatives for the next 50 years (appendix K).

If instead of considering only those WAAs in which hunters were successful, we consider all WAAs ever hunted by community residents, then there would be sufficient deer habitat capability to support all subsistence hunters in the WAAs used for hunting by all subsistence communities except for Pelican and Gustavus. If instead of assuming a 10 percent harvest level, a 20 percent harvest level is used, there would be sufficient habitat capability to support all subsistence harvest in all WAAs used for hunting by all subsistence communities.

As a result of the analysis of the impacts of projects that would be permissible under each of the alternatives considered for adoption in the Forest Plan, it has been determined that all of the alternatives, if all permissible projects were fully implemented, have the potential to impact subsistence uses of deer, brown bear, and furbearers (specifically martens) due to potential effects of projects on abundance/distribution, and competition.

The analysis shown in chapter 3 of this Project EIS is supported by the analysis shown above in the TLMP SDEIS. The conclusion stated above, "it has been determined that all of the alternatives, if all of the permissible projects were fully implemented, have the potential

to impact subsistence uses of deer. . .", supports the conclusion that any environmental analysis area within the Tongass would have a similar chance of having a significant possibility of a significant restriction on subsistence resources for Sitka Black-tailed deer, and other mammals.

The analysis for ANILCA section 810 are shown in the Subsistence section of chapter 4, in this EIS. The determinations made from the ANILCA section 810 analysis and findings will be a part of the Record of Decision for this project.

Forest Plan Implementation

Review of Available Volume

A review was conducted of each VCU within the designated sale area for available volume. This analysis was based on computer inventories and Allowable Sale Quantity (ASQ) calculations from TLMP Draft Revision (1991a).

The review used the following guidelines to identify likely areas to schedule for environmental analysis in the near future:

- (1) Evaluate by area the total available volume within the designated sale area. Between 1991 and 1993, there is a need to identify a potential harvest of 700 MMBF.
- (2) Identify a tentative operating schedule which addresses volume to be offered from the Ketchikan Area.
- (3) Prepare a schedule of environmental analysis areas which shows how the Ketchikan Area will meet the tentative operating schedule from 1991 through the end of the contract. This schedule must provide a minimum of 615 MMBF 'current timber supply' through the end of the contract.

The results of the first step by the working group analysis are presented in table 5. The results of this volume review, further supported by TLMP revision information, provided the basis for scheduling the next series of environmental analyses.

Table 4
Available Volume By Project In The KPC Contract Boundary

Project Area	MAs in Project Area	(MMBF)
Central Prince of Wales	K03 (Portion), K07, K08, K09, K10	267
Ratz	K09 (Portion)	10
Luck Lake	K08 (Portion), K09 (Portion)	60
Tuxekan	K07	15
Lab Bay	K01, K03 (Portion)	85
North POW	K01, K03	90
Polk Inlet	K17, K18	113
Chomly	K18, K19	80
North Revilla	K32 (Portion)	200
Sea Level	K35	20
Control Lake	K08, K14, K15	187
Upper Carroll	K32 (Portion)	70
Vixen Inlet	K29	60
Port Stewart	K30	105
Lower Carroll	K34, K35	40
South Pow	K28	35
Chasina	K24	40
Moir	K25	70

Analysis Area Reviews

For each area identified as having sufficient volume available to consider for further environmental analysis at this time, a review was conducted to decide which areas to schedule first, considering the current TLMP and proposed revised TLMP schedule, and other factors described below. The results of this review and supporting reasons for each area appear below:

Central Prince of Wales - This project area is located within TLMP management areas K03, K07, K08, K09 and K10. The area has had extensive harvesting in the past. No additional log transfer facilities (LTF's) are required to harvest timber in this area. The majority of the road system is already in place, only limited additional road construction would be required. The area is entirely within the primary sale area. This area was given the highest priority due to it's location within the primary sale area, ease of access, prior harvest and no additional LTF construction. The environmental analysis has been completed.

North Revilla - This project area is located within TLMP management area K32. The area has had extensive harvesting in the past. It is located within the primary sale. A large amount of new road construction will be needed in the area. Road construction into the area is difficult due to steep terrain and unstable slopes. Nine LTFs will be required to access the area, of which three will require new construction. The area was given high priority since it is located within the primary sale area, has had prior harvest and road construction, and a logging system transportation analysis had already been completed for the area. It was not given highest priority due the requirement of three new LTFs and difficult road construction. The environmental analysis has been completed.

Polk Inlet - This project area is located within TLMP management areas K17 and K18. The K17 portion of the area is located within the primary sale area. The area has had extensive harvesting in the past. Roads have been developed previously into the area but construction is difficult due to the terrain. A logging system transportation analysis was completed for the area as part of the 1989-1994 EIS. Three new LTF's will be required to enter the area but they have already been approved for construction under the 1989-1994 EIS and their required permits have been acquired or in process. The area was given a high priority since it has a large portion located within primary sale area, has had previous harvest, and has had prior road development. The area was not given highest priority due to LTF construction and difficult access. The environmental analysis has been completed.

Lab Bay - This project area is located within TLMP management area K01 and K03. The area has had extensive harvesting in the past. One additional LTF will be required, other timber will utilize two existing LTF's. The vast majority of timber will have to pass through these two existing LTFs. The limited number of additional LTF's in the area could create a bottle neck getting wood from the field into the water. The area was given a high priority since it is in the primary sale area, has current road access, and has had previous harvest. It was not given highest priority due to a limited number of LTF's to put logs into the water.

Sea Level - This project area is located within TLMP management area K35. The area has had limited harvesting in the past. The area is within the KPC long term contract, however it is outside the primary sale area boundary. Road construction is difficult in the area but no new LTF's are required to access the timber. This area was given a moderate priority for scheduling due to being within the timber sale contract and not requiring any new LTF's.

Control Lake - This project area is located within TLMP management area K08, K14 and K15. The area has had extensive harvesting in the past. No additional log transfer facilities (LTF's) are required to harvest timber in this area. The majority of the road system is already in place, only limited additional road construction would be required. The area is within the long-term contract area, but not within the primary sale area portion. This area was given a moderate priority since it had ease of access, prior harvest and no additional LTF construction but was not within the primary sale area.

Upper Carroll - This project area is located within TLMP management area K32. The area has had limited harvesting in the past. The area is within the KPC long term contract, however it is outside the primary sale area boundary. Road access in the area is difficult. One new LTF will be required. Road construction associated with this project may help complete the linkage for the transportation utility corridor planned for the area. This area was given a moderate priority for scheduling despite the potential transportation utility corridor due to difficult access and not being in the primary sale area.

Ratz - This project area is located within TLMP management area K09. The area is within the Central Prince of Wales project area and has had extensive harvesting in the past. No additional LTF's are required to harvest timber in the area. The area is within the primary sale area and can concentrate harvest in areas that were not available, primarily due to adjacency, in the original project. This project area was given a lower priority for scheduling primarily due to low potential volume.

Luck Lake - This project area is located within TLMP management areas K08 and K09. The area is within the Central Prince of Wales project area and has had extensive harvesting in the past. No additional LTF's are required to harvest timber in the area. The area is within the primary sale area and can concentrate harvest in areas that were not available,

primarily due to adjacency, in the original project. This project area was given a lower priority for scheduling primarily due to low potential volume.

Tuxecan - This project area is located within TLMP management area K07. The area is partially within the Central Prince of Wales project area and includes Tuxecan Island. It has had extensive harvesting in the past. Tuxecan Island has extensive karst development. No additional LTF's are required to harvest timber in the area. The area is within the primary sale area and can concentrate harvest in areas that were not available, primarily due to adjacency, in the original project. This project area was given a lower priority for scheduling primarily due to low potential volume.

North POW - This project area is located within TLMP management areas K01 and K03. The area is within the Lab Bay project area and has had extensive harvesting in the past. No additional LTF's are required to harvest timber in the area. The area is within the primary sale area and can concentrate harvest in areas that were not available, primarily due to adjacency, in the original project. This project area was given a lower priority for scheduling primarily due to low potential volume.

Chomly - This project area is located within TLMP management areas K18 and K19. The area has had limited harvesting in the past except K18 which is in the Polk Inlet project area. Additional LTF's would be required to harvest timber in the area. The area is outside the primary sale area. Recreation use is heavy and developmental costs for timber sales will be very high in relation to relatively low timber outputs. This project area was given a lower priority for scheduling.

Vixen Inlet - This project area is located within TLMP management area K29. The area has had limited harvesting in the past. There is potentially a large amount of volume available in the area, although it is somewhat scattered. This will require a high ratio of miles of road construction per MBF of timber harvest. The area is within the KPC long term contract, however it is outside the primary sale area boundary. The project is on Cleveland Peninsula which has important wildlife and recreation values. There is currently no road access into the area. There are no existing LTF's and one new LTF would be required. This area was given a moderate priority for scheduling due the large amount of potential volume and since it is within the long term sale boundary. It was not given a high priority since it is not within the primary sale area and has high recreation and wildlife values.

Port Stewart - This project area is located within TLMP management area K30. The area has had limited harvesting in the past. There is potentially a large amount of volume available in the area, although it is somewhat scattered. This will require a high ratio of miles of road construction per MBF of timber harvest. The area is within the KPC long term contract, however it is outside the primary sale area boundary. The project is on Cleveland Peninsula which has important wildlife and recreation values. There is currently no road access into the area. There are no existing LTF's and one new LTF would be required. This area was given a moderate priority for scheduling due the large amount of potential volume and since it is within the long term sale boundary. It was not given a high priority since it is not within the primary sale area and has high recreation and wildlife values.

Lower Carroll - This project area is located within TLMP management area K34 and K35. The area has had limited harvesting in the past. The area is within the KPC long term contract, however it is outside the primary sale area boundary. The area was recently analyzed as part of the Shelter Cove EIS. As part of that EIS a logging system transportation analysis was developed for the area. Remaining volume potentially available for harvest from this area is low. This area was given a low priority for scheduling due to not being in

the primary sale area, low amount of potential volume, and having been recently analyzed as part of another EIS.

Moirá - This project area is located within TLMP management area K25. The area has had limited harvesting in the past and is outside the primary sale area. The area would require the construction of new LTF's and road construction is expected to be difficult. The area is used heavily for recreation and subsistence purposes. The area is expected to yield low volumes of timber and was given a lower priority for scheduling.

South POW - This project area is located within TLMP management area K28. The area has had extensive harvesting in the past. The area is within the KPC long term contract, however it is outside primary sale area boundary. There is no existing logging system transportation analysis available for the area. The area would require the construction of three new LTF's. Road construction in the area would be very difficult. The quality and quantity of timber in the area is not very high. The result is that timber harvest in the area is likely to be economically marginal. As a result of these factors, this area was given a low priority for scheduling.

Results of Analysis

Upon completion of the above analysis, four project areas (Central Prince of Wales, North Revilla, Polk Inlet and Lab Bay) were identified and scheduled for environmental analysis first. The four timber projects were initiated which had a high priority and were within the KPC "Primary Sale Area". The KPC contract provides direction to seek to find timber supplies within the Primary Sale Area before seeking volume within contingency areas. In addition to being within the Primary Sale Area, these four projects reflected the highest scheduling priority to provide volume that could contribute to timber supply needs. The environmental analysis for three of the four projects are completed and a draft EIS has been published for the fourth (Lab Bay). Environmental analysis has been initiated for several of the moderate and lower priority project areas including Control Lake.

In addition to project areas relative ability to provide timber, other factors considered in making this volume determination for the Control Lake project included: (1) this harvest level is consistent with the sale schedule in the TLMP (1979a, as amended); (2) sufficient volume has been determined to be available in the project area; (3) there is an extensive road network in place; (4) the number and location of Log Transfer Facilities (LTF's) is sufficient to handle this volume of timber within a three-year time frame; (5) there are existing logging camps within the area to handle this volume; and (6) the current Forest Plan (TLMP 1979a, as amended) calls for harvest in this project area.

Comments received during the Environmental Impact Statement process for the first four projects expressed a concern regarding the sustainability of the timber harvest levels. The concern was made for the Ketchikan Area as whole, as well as the distribution of the harvesting within the Area. To address these concerns additional analysis was performed to estimate Ketchikan Area wide timber harvest levels over the next 50 years by Management Area. This analysis was done by Management Area to give a spatial indication of where the harvests would occur. It was done for 50 years since this is the estimated period until the second growth produced by earlier cutting would become available for harvest once again. This analysis also assumes that; 1) price increases for wood products will occur resulting in making economically marginal lands possible to harvest, and 2) there will be no further reductions in the suitable land base due to legislation, Forest Planning, or other factors. The analysis indicates that although timber harvest levels can be sustained Ketchikan Area wide, there will be some shifts through time as to where that harvest incurs.

Appendix B

Additional Information on Alternatives 4, 6, and 10

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1.0 INTRODUCTION

This appendix presents information on three alternatives considered but eliminated from detailed study in the Control Lake Draft Environmental Impact Statement (see Chapter 2 of the Draft EIS). Because of the level of interest exhibited in them during the scoping process, they were studied in considerable detail, and additional information on these alternatives is presented here. The alternatives considered in this appendix are Alternatives 4, 6, and 10. The information provided here is in an abbreviated form similar to that provided in Chapters 2 and 4 of the main Draft Environmental Impact Statement. Section 2.0 below provides brief descriptions of the alternatives and summarizes their environmental consequences. A brief comparison of the three alternatives is presented in terms of physical and economic outputs and landscape zone effects. Section 3.0 describes the environmental effects of the three alternatives. Section 3.0 is presented in a similar sequence to Chapter 4 (Environmental Effects) of the Draft EIS. Foldout color maps of the alternatives are provided at the end of this appendix.

2.0 ALTERNATIVES

This section describes and compares Alternatives 4, 6, and 10, which were studied in considerable detail, but are placed in this appendix, because they did not meet the stated purpose and need of producing 187 MMBF. The first part of this section describes the alternatives and summarizes the environmental consequences of implementing the alternatives by significant issue. Alternative 1 is described here again to facilitate comparisons with existing conditions. This part is followed by a brief comparison of these three alternatives in terms of physical and economic outputs and landscape zone effects. Foldout color maps of Alternatives 4, 6, and 10 are provided at the end of this appendix.

2.1 ALTERNATIVE 1

Framework

Alternative 1, also called the No Action Alternative, would result in no timber (No Action) harvest or road construction in the Control Lake Project Area that is additional to the timber harvest already cleared by the 1989-94 EIS. Under this alternative, replacement timber volume would probably not be available from somewhere else within the Ketchikan Area at this time. This alternative serves as a baseline against which to measure the effects of the action alternatives.

Resource Outputs

There are no new timber harvest outputs associated with this alternative. Timber harvest and road and log transfer facility (LTF) construction would halt in late 1994 following full implementation of the 1989-94 EIS.

Economic Outputs

Because Alternative 1 would result in no new timber harvest or road construction beyond that which is already approved, there would be no timber-related economic outputs. Additional receipts to the State of Alaska would be foregone and no new timber jobs would be created.

Environmental Consequences

A summary of the environmental consequences of implementing Alternative 1 by significant issue is presented below. The effects described are additional to those occurring as a result of implementation of the 1989-94 EIS.

Issue 1—Honker Divide

Under Alternative 1, no further road building or timber harvest would occur in the Honker Divide area. Recreational and subsistence access to the area would remain the same as at present.

Issue 2—Recreation and Visual Quality

Under Alternative 1, visual quality and recreation and tourism opportunities would remain unchanged in the Project Area.

Issue 3—Subsistence

Subsistence use of the Project Area would not be affected under Alternative 1. No timber harvest or road construction would occur in the 25,723 cumulative acres of subsistence use areas in the Project Area used by 15 percent or more of a rural community's households.

A significant possibility of a significant restriction of subsistence use of deer, black bear, and marten would occur in some areas related to past timber harvest.

Issue 4—Wildlife Habitat and Biodiversity

All effects on habitat and biodiversity would be avoided resulting in no change from existing conditions except for those changes resulting from natural factors such as plant succession.

TTRA proportionality (proportion of Volume Class 6 and 7 remaining in each MA; area-based method) would be 0.24 percent greater than the TTRA baseline for MA K08, 0.75 percent less than the baseline for K14, and 0.16 percent greater than the baseline for MA K15.

Issue 5—Fish Habitat and Water Quality

No effects on fish habitat or water quality are expected other than those caused by two factors independent of the Control Lake Project. First, there would be continued slight degradation of fish habitat resulting from lack of large woody debris recruitment caused by past timber harvesting to the stream bank. Second, fish habitat enhancement projects are expected to result in increased fish habitat capability.

Issue 6—Timber Economics and Supply

Alternative 1 would result in no timber-related economic outputs and therefore would not provide any direct return to the U.S. Treasury. The current timber supply in the Control Lake Project Area would be unaffected.

No economic return to the State of Alaska due to timber harvest would occur.

No timber jobs would be created in the Control Lake Project Area until another timber project is evaluated and implemented.

Lack of timber harvest activity in the Project Area would likely result in significant slowdown at the Thorne Bay KPC facilities and economic impacts on Thorne Bay residents after 1994. Economic impacts would, at least temporarily, occur to some residents of Thorne Bay, Coffman Cove, Craig, Klawock, and Ketchikan who depend directly or indirectly on timber harvesting in the Project Area.

Issue 7—Karst and Cave Resources

Alternative 1 would have no effect on the karst or cave resources of the Project Area.

2.2 ALTERNATIVE 4

Framework

Under this alternative, timber, economics, and conventional cable yarding would be emphasized. Criteria used in the development of this alternative are that at least 1 MMBF of timber volume should be provided per mile of road and no helicopter units would be included unless they were immediately adjacent to the road system.

Resource Outputs

Implementation of Alternative 4 would result in the harvest of 4,555 acres in 105 harvest units producing approximately 129 MMBF of net sawlog and utility volume. This volume includes approximately 5 MMBF from road right-of-way (ROW) clearing. Average unit size would be about 43.4 acres and 3 units would exceed 100 acres. Of this harvest, 708 acres are planned for partial cut; the remainder are planned for clearcut harvest. The retention of reserve trees is planned to varying degrees in all units proposed for clearcutting. To implement this harvest, approximately 96 miles of road would be constructed or reconstructed.

No new LTF's would be needed. Timber harvested would be hauled to existing LTF's at Winter Harbor, Naukati, Coffman Cove, or Thorne Bay.

Economic Outputs

Preliminary economic analysis indicates that Alternative 4 would produce an overall net stumpage value in the range of \$146.39 per thousand board feet (MBF) based on current timber values. The present net value (PNV) of Alternative 4 was estimated to be \$11.8 million. Payments to the State of Alaska resulting from Alternative 4 were estimated at \$8.9 million. Average annual direct jobs created were estimated at 239 over 4 years.

Environmental Consequences

A summary of the environmental consequences of implementing Alternative 4 by significant issue is presented below.

Issue 1—Honker Divide

Changes to the unroaded character of the Honker Divide area would be moderate to high. Roaded access and related recreation and subsistence use would increase, though no direct roaded access to the river would occur. The Thorne River/Hatchery Creek canoe route would remain somewhat isolated but with additional potential for wilderness-oriented recreationists to hear logging operations in the short term and compete with road-oriented recreationists over the long-term.

Issue 2—Recreation and Visual Quality

There would be no changes in the visual quality of the West Coast Waterway.

Changes in the visual quality from the Control Lake Cabin would be low.

Changes in the visual quality from the Eagle's Nest Campground (Balls Lake) would be low.

There would be no changes in the visual quality from the Cutthroat Lakes area.

Changes in the visual quality of the sensitive viewshed along the Thorne River-Hatchery Creek Canoe Route would be low.

Timber harvest would have minimal effects on existing and potential recreation sites.

Timber harvest and road construction would result in a change of approximately 33,834 acres from unroaded to roaded Recreation Opportunity Spectrum (ROS) settings.

Issue 3—Subsistence

About 490 acres used by more than 15 percent of rural community households for deer hunting would be harvested.

Based on the wildlife analysis and existing harvest levels, deer habitat capability would be below that needed to support current total harvest levels, but would be above that needed to support rural harvests indicating that there may be a need to restrict non-subsistence users.

Black bear and marten habitat capabilities would be below needed populations in some areas and close to needed populations for the Project Area as a whole.

Issue 4—Wildlife Habitat and Biodiversity

The major effect would be the harvest of 4,555 acres of wildlife habitats. This includes 4,106 acres of old-growth forest habitat (Volume Classes 4 to 7) or about 5 percent of the remaining old growth.

TTRA proportionality would be 0.26 percent greater than the baseline for Management Area K08, 0.79 percent less for Management Area K14, and 0.13 percent less for Management Area K15 (area-based method). The 96 miles of road construction/reconstruction would provide new access into unroaded areas. Because no new LTF's or logging camps would be required, habitat and disturbance impacts from these sources would be avoided.

Harvest under Alternative 4 would leave 30,973 acres within the old-growth blocks identified for the Project, to serve as retention. A total of 1,101 acres of timber harvest would occur within old-growth blocks and 568 acres would occur in corridors with the implementation of Alternative 4.

The acreage of unfragmented old-growth patches greater than 10,000 acres in size would be reduced from 29,739 to 27,358; there would be 6,331 total acres of patches greater than 5,000 acres. The acreage of unfragmented interior old-growth patches greater than 1,000 acres would be decreased from 10,210 to 7,152 acres.

Sitka black-tailed deer habitat capability would be reduced by 3 percent and 16 harvest units in high quality winter range would be harvested.

Threatened or endangered species would not be affected.

Issue 5—Fish Habitat and Water Quality

No measurable effects on fish and water quality are expected due to implementation of TTRA buffers, additional-width buffers, BMP's, and other mitigation measures.

Cumulative watershed harvest thresholds would not be exceeded for any major watershed.

Measures of potential risk to water quality and fish habitat are as follows: (1) a soil disturbance index of 1,082 acres was estimated due to timber harvest and road construction; (2) 2,154 acres of high hazard soils and 0 acres of very high hazard soils would be harvested; (3) 651 acres of riparian area (primarily around lakes and along Class III streams) would be harvested outside of no-cut buffers. Additionally, roads would cross 31 Class I, 45 Class II, and 170 Class III streams, and streamside vegetation would be removed along 41.3 miles of Class III streams.

Issue 6—Timber Economics and Supply

Preliminary economic analysis indicates an overall net stumpage value of \$146.39/MBF based on current timber values. The estimated PNV associated with this alternative is \$11.8 million.

Issue 7—Karst and Cave Resources

Five harvest units in this alternative were identified during field surveys as having potentially significant cave resources. Identified mitigation measures would be implemented to avoid effects to these caves unless further field surveys and analysis determine that they are not significant resources.

2.3 ALTERNATIVE 6

Framework

This alternative uses the landscape zones as a basis for design. Harvest is scheduled to maintain the values and functions of all landscape zones throughout a harvest rotation. It schedules timber harvest in all landscape zones except HCA's. Landscape zone-

specific regeneration harvest schedules are calculated based on a 15-year entry frequency and using a 100-year rotation for the Timber Production LUD, a 140-year rotation for the Modified Landscape LUD, a 170-year rotation for the Scenic Viewshed LUD, and a 200-year rotation for corridors.

Resource Outputs

If Alternative 6 were implemented, it would result in the harvest of 4,021 acres in 99 harvest units producing approximately 106 MMBF of net sawlog and utility volume. This volume includes approximately 4 MMBF from road ROW clearing. Average unit size would be about 40.6 acres and 3 units would exceed 100 acres. Of this harvest, 917 acres are planned for partial cut; the remainder are planned for clearcut harvest. The retention of reserve trees is planned to varying degrees for all units proposed for clearcutting. To implement this harvest, approximately 94 miles of road would be constructed or reconstructed.

No new LTF's would be needed. Timber harvested would be hauled to existing LTF's at Winter Harbor, Naukati, Coffman Cove, or Thorne Bay.

Economic Outputs

Preliminary economic analysis indicates that Alternative 6 would produce an overall net stumpage value of \$130.32 per MBF. The PNV of Alternative 6 was estimated to be \$7.6 million. Payments to the State of Alaska resulting from Alternative 6, were estimated at \$7.5 million. Average annual direct jobs created were estimated at 193 over 4 years.

Environmental Consequences

A summary of the environmental consequences of implementing Alternative 6 by significant issue is presented below.

Issue 1—Honker Divide

Changes to the unroaded character of the Honker Divide would be low. Roaded access and related recreation and subsistence use would increase though no direct roaded access to the river would occur. The Thorne River/Hatchery Creek canoe route would remain isolated but with some additional potential for wilderness-oriented recreationists to hear

logging operations in the short term and compete with road-oriented recreationists over the long term.

Issue 2—Recreation and Visual Quality

Changes in the visual quality of the West Coast Waterway would be low.

Changes in the visual quality from the Control Lake Cabin would be low.

Changes in the visual quality from the Eagle's Nest Campground (Balls Lake) would be low.

There would be no changes in the visual quality from the Cutthroat Lakes area.

Changes in the visual quality of the sensitive viewshed along the Thorne River-Hatchery Creek Canoe Route would be low.

Timber harvest would have minimal effects on existing and potential recreation sites.

Timber harvest and road construction would result in a change of approximately 33,792 acres from unroaded to roaded Recreation Opportunity Spectrum (ROS) settings.

Issue 3—Subsistence

About 245 acres used by more than 15 percent of rural community households for deer hunting would be harvested.

Based on the wildlife analysis and existing harvest levels, deer habitat capability would be below that needed to support current total harvest levels, but would be above that needed to support rural harvests, indicating that there may be a need to restrict non-subsistence users.

Black bear and marten habitat capabilities would be below needed populations in some areas and close to needed populations for the Project Area as a whole.

Issue 4—Wildlife Habitat and Biodiversity

The major effect would be the harvest of 4,021 acres of wildlife habitats. This includes 3,606 acres of old-growth forest habitat (Volume Classes 4 to 7) or about 5 percent of the remaining old growth.

TTRA proportionality would be 0.46 percent greater than the baseline for Management Area K08, 0.73 percent less for Management Area K14, and 0.13 percent greater for Management Area K15 (area-based method). The 94 miles of road construction/reconstruction would provide new access into unroaded areas. Because no new LTF's or logging camps would be required, habitat and disturbance impacts from these sources would be avoided.

Harvest under Alternative 6 would leave 31,999 acres within the old-growth blocks identified for the Project, to serve as retention. A total of 13 acres of timber harvest on the edges of old-growth blocks and 586 acres would occur in corridors with the implementation of Alternative 6.

The acreage of unfragmented old-growth patches greater than 10,000 acres in size would be reduced from 29,739 to 28,052; there would be 5,948 total acres of patches greater than 5,000 acres. The acreage of unfragmented interior old-growth patches greater than 1,000 acres would be decreased from 10,210 to 7,167 acres.

Sitka black-tailed deer habitat capability would be reduced by 3 percent and 16 harvest units in high quality winter range would be harvested.

Threatened or endangered species would not be affected.

Issue 5—Fish Habitat and Water Quality

No measurable effects on fish and water quality are expected due to implementation of TTRA buffers, additional-width buffers, BMP's, and other mitigation measures. Cumulative watershed harvest thresholds would not be exceeded for any major watershed.

Measures of potential risk to water quality and fish habitat are as follows: (1) a soil disturbance index of 953 acres was estimated due to timber harvest and road construction; (2) 2,242 acres of high hazard soils and zero acres of very high hazard

soils would be harvested; (3) 635 acres of riparian area (primarily around lakes and along Class III streams) would be harvested outside of no-cut buffers. Additionally, roads would cross 39 Class I, 44 Class II, and 151 Class III streams, and streamside vegetation would be removed along 39.5 miles of Class III streams.

Issue 6—Timber Economics and Supply

Preliminary economic analysis indicates an overall net stumpage value of \$130.32/MBF based on current timber values. The PNV associated with these stumpage values is \$7.6 million.

Issue 7—Karst and Cave Resources

Six harvest units in this alternative were identified during field surveys as having potentially significant cave resources. Identified mitigation measures would be implemented to avoid effects to these caves unless further field surveys and analysis determine that they are not significant resources.

2.4 ALTERNATIVE 10

Framework

This alternative is similar to Alternative 6 except that it does not schedule harvest in the Honker Divide "ridge to ridge" north of Forest Road 30, in the Logjam Creek area in Rio Roberts watershed, or in the Western Peninsula. It uses the harvest scheduling process described in Alternative 6 for areas to be entered. The alternative attempts to emphasize community-based, value-added products by choosing units that would be more easily harvested by independent and small operators. Units in this alternative minimize road construction, are smaller, and use conventional logging systems. This alternative was independently developed by a special interest group consisting of environmental organization representatives, independent timber contractors, and residents of Prince of Wales Island.

Resource Outputs

Implementation of Alternative 10 would result in the harvest of 1,281 acres in 38 harvest units producing approximately 38 MMBF of net sawlog and utility volume. This volume includes approximately 2 MMBF from road ROW clearing. Average unit size would be about 33.7 acres and 1 unit would exceed 100 acres. Of this harvest, 140

acres are planned for partial cut; the remainder are planned for clearcut harvest. The retention of reserve trees is planned to varying degrees for all units proposed for clearcutting. To implement this harvest, approximately 24 miles of road would be constructed or reconstructed.

No new LTF's would be needed. Timber harvested would be hauled to existing LTF's at Winter Harbor, Naukati, Coffman Cove, or Thorne Bay.

Economic Outputs

Preliminary economic analysis indicates that Alternative 10 would produce an overall net stumpage value of \$129.53 per MBF based on current timber values. The PNV of Alternative 10 was estimated to be \$2.9 million. Payments to the State of Alaska resulting from Alternative 10 were estimated at \$2.2 million. Average annual direct jobs created were estimated at 72 over 4 years.

Environmental Consequences

A summary of the environmental consequences of implementing Alternative 10 by significant issue is presented below.

Issue 1—Honker Divide

No changes to the unroaded character of the Honker Divide would occur. Overall roaded access and related recreation and subsistence use would not increase. The Thorne River/Hatchery Creek canoe route would remain isolated.

Issue 2—Recreation and Visual Quality

No changes in the visual quality of the West Coast Waterway would occur.

No changes in the visual quality from the Control Lake Cabin would occur.

No changes in the visual quality from the Eagle's Nest Campground (Balls Lake) would occur.

No changes in the visual quality from the Cutthroat Lakes area would occur.

No changes in the visual quality of the sensitive viewshed along the Thorne River-Hatchery Creek Canoe Route would occur.

Timber harvest would have minimal effects on existing and potential recreation sites.

Timber harvest and road construction would result in a change of approximately 4,611 acres from unroaded to roaded Recreation Opportunity Spectrum (ROS) settings.

Issue 3—Subsistence

About 222 acres used by more than 15 percent of rural community households for deer hunting would be harvested.

Based on the wildlife analysis and existing harvest levels, deer habitat capability would be below that needed to support current total harvest levels, but would be above that needed to support rural harvests, indicating that there may be a need to restrict non-subsistence users.

Black bear and marten habitat capabilities would be below needed populations in some areas and close to needed populations for the Project Area as a whole.

Issue 4—Wildlife Habitat and Biodiversity

The major effect would be the harvest of 1,281 acres of wildlife habitats. This includes 1,124 acres of old-growth forest habitat (Volume Classes 4 to 7) or about 1 percent of the remaining old growth.

TTRA proportionality would be 0.24 percent greater than the baseline for Management Area K08, 0.67 percent less for Management Area K14, and 0.62 percent greater for Management Area K15 (area-based method). The 24 miles of road construction/reconstruction would provide new access into unroaded areas. Because no new LTF's or logging camps would be required, habitat and disturbance impacts from these sources would be avoided.

Harvest under Alternative 10 would leave 32,013 acres within the old-growth blocks identified for the Project, to serve as retention. A total of 61 acres of timber harvest would occur within old-growth blocks and with the implementation of Alternative 10. This harvest would leave 24,301 acres to serve as old growth retention within the HCA's. There would be no harvest within corridors.

The acreage of unfragmented old-growth patches greater than 10,000 acres in size would not be reduced; there would be 5,948 total acres of patches greater than 5,000 acres. The acreage of unfragmented interior old-growth patches greater than 1,000 acres would be decreased from 10,210 to 10,065 acres.

Sitka black-tailed deer habitat capability would be reduced by 1 percent and 2 harvest units in high quality winter range would be harvested.

Threatened or endangered species would not be affected.

Issue 5—Fish Habitat and Water Quality

No measurable effects on fish and water quality are expected due to implementation of TTRA buffers, additional-width buffers, BMP's, and other mitigation measures. Cumulative watershed harvest thresholds would not be exceeded for any major watershed.

Measures of potential risk to water quality and fish habitat are as follows: (1) a soil disturbance index of 346 acres was estimated due to timber harvest and road construction; (2) 558 acres of high hazard soils and 0 acres of very high hazard soils would be harvested; (3) 232 acres of riparian area (primarily around lakes and along Class III streams) would be harvested outside of no-cut buffers. Additionally, roads would cross 11 Class I, 19 Class II, and 4 Class III streams, and streamside vegetation would be removed along 14.2 miles of Class III streams.

Issue 6—Timber Economics and Supply

Preliminary economic analysis indicates an overall net stumpage value of \$129.53/MBF based on current timber values. The PNV associated with this alternative is \$2.9 million.

Issue 7—Karst and Cave Resources

No harvest units in this alternative were identified during field surveys as having potentially significant cave resources.

2.5 COMPARISON OF ALTERNATIVES

This section summarizes the environmental consequences of the alternatives in a comparative format. First, a summary of the physical and economic outputs of the

alternatives are presented in Table 2-1. Next, the environmental consequences of the alternatives are summarized by landscape zone in Table 2-2. More detailed descriptions of the environmental consequences of the alternatives are presented in Section 3.0 of this appendix.

Table 2-1. Physical and Economic Outputs of Alternatives

Page 1 of 2

Item	Units	Alternative			
		1	4	6	10
Timber					
Harvest Units	Number	0	105	99	38
Harvest Units	Acres	0	4,555	4,021	1,281
Avg. Unit Size		0	43.4	40.6	33.7
Avg. Volume per acre (in units)	MBF	0	27.2	25.3	30.1
Units over 100 acres	Number	0	3	3	1
Total Volume (including ROW)	MMBF	0	129	106	38
Silvicultural System					
Clearcut					
Type A	Acres	0	2,591	2,304	740
Type B	Acres	0	1,142	639	309
Type C	Acres	0	114	161	93
Overstory Removal	Acres	0	123	115	6
Seed Tree	Acres	0	109	47	21
Shelterwood (Type G Harvest)	Acres	0	131	129	88
Shelterwood (Type H Harvest)	Acres	0	59	28	12
Uneven-aged Management	Acres	0	286	598	13
Logging System					
Highlead Harvest	Acres	0	600	564	308
Shovel Harvest	Acres	0	362	299	81
Running Skyline Harvest	Acres	0	1,541	1,134	338
Live Skyline Harvest	Acres	0	1,041	779	195
Slackline Harvest	Acres	0	834	507	181
Helicopter Harvest	Acres	0	176	738	177

Table 2-1. Physical and Economic Outputs of Alternatives

Page 2 of 2

Item	Units	Alternative			
		1	4	6	10
Proposed Proportionality					
Acreage-based Method					
Management Area K08 (TTRA Baseline=21.23%)		21.47	21.49	21.69	21.47
Management Area K14 (TTRA Baseline=14.88%)		14.13	14.09	14.15	14.21
Management Area K15 (TTRA Baseline=21.42%)		21.58	21.29	21.55	22.03
Roads and Facilities					
Road Construction/Reconstruction	Miles	0	91.4	84.2	29.5
Road Construction/Reconstruction	Acres	0	760	703	245
New Log Transfer Facilities	Number	0	0	0	0
Potential for New Logging Camps	Number	0	0	0	0
Economics					
Estimated Net Stumpage	\$/MBF		\$146.39	\$130.32	\$129.53
Present Net Value	\$ million		\$11.8	\$7.6	\$2.9
Payments to State of Alaska	\$ million	0	\$8.9	\$7.5	\$2.2
Average Annual Direct Jobs Over 4 Years	# of jobs	0	239	193	72

Table 2-2. Landscape Zone Effects

1. HONKER WATERSHED

Alternative 1

No units harvested or roads constructed; watershed functions, water quality, fisheries habitat maintained.

Alternative 4

3,213 acres harvested within the watershed and 56 miles of road constructed. Watershed functions, water quality, fisheries habitat maintained by unit and road design and BMP implementation.

Alternative 6

2,251 acres harvested within the watershed and 30 miles of road constructed. Watershed functions, water quality, fisheries habitat maintained by unit and road design and BMP implementation.

Alternative 10

733 acres harvested within the watershed and 14 miles of road constructed. Watershed functions, water quality, fisheries habitat maintained by unit and road design and BMP implementation.

2. HONKER BLOCK

Alternative 1

No units harvested or roads constructed. Ability to function as a medium old growth block maintained.

Alternative 4

1,101 acres harvested and 24 miles of road constructed. Ability to function as a medium old growth block moderately reduced.

Alternative 6

13 acres harvested and 1 mile of road constructed. Ability to function as a medium old growth block maintained.

Alternative 10

60 acres harvested and 1 mile of road constructed. Ability to function as a medium old growth block maintained.

3. HONKER SCENIC CORRIDOR

Alternative 1

No units harvested or roads constructed. Recreational and visual resources maintained at present levels.

Alternative 4

92 acres of harvest and 3 miles of road constructed. No visible units or roads. Recreational and visual resources would be impacted by changes in the unroaded character of the area and access-related effects.

Alternative 6

10 acres of harvest and 1 mile of road constructed. No visible units or roads. Recreational and visual resources maintained at present levels.

Alternative 10

No units harvested or roads constructed. Recreational and visual resources maintained at present levels.

4. BAIRD PEAK LATE-SUCCESSIONAL CORRIDOR

Alternative 1

No units harvested or roads constructed. Ability to function as a corridor maintained.

Alternative 4

114 acres of harvest and 2 miles of road constructed. Ability to function as a corridor maintained.

Alternative 6

90 acres harvested and 0.5 mile of road constructed. Ability to function as a corridor maintained.

Alternative 10

No units harvested or roads constructed. Ability to function as a corridor maintained.

5. GOSHAWK POST-FLEDGING AREA LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.	25 acres harvested and 1 mile of road constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.

6. GOSHAWK POST-FLEDGING AREA

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as post-fledging area and small old growth block maintained.	No units harvested or roads constructed. Ability to function as post-fledging area and small old growth block maintained.	No units harvested or roads constructed. Ability to function as post-fledging area and small old growth block maintained.	No units harvested or roads constructed. Ability to function as post-fledging area and small old growth block maintained.

7. UPPER CUTTHROAT LAKES

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Recreational, visual, wildlife, and aquatic resources maintained at present levels.	No units harvested or roads constructed. Recreational, visual, wildlife, and aquatic resources maintained at present levels.	No units harvested or roads constructed. Recreational, visual, wildlife, and aquatic resources maintained at present levels.	No units harvested or roads constructed. Recreational, visual, wildlife, and aquatic resources maintained at present levels.

8. DRUMLIN FIELD

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to provide old-growth habitat, winter range, and wetland habitat completely maintained.	478 acres harvested and 9 miles of road constructed. Ability to provide old-growth habitat and winter range moderately reduced. Wetland values and functions maintained through BMP's.	96 acres harvested and 2 miles of road constructed. Ability to provide old-growth habitat and winter range slightly reduced. Wetland values and functions maintained through BMP's.	104 acres harvested and 3 miles of road constructed. Ability to provide old-growth habitat and winter range slightly reduced. Wetland values and functions maintained through BMP's.

Table 2-2. Landscape Zone Effects

9. 30 ROAD CORRIDOR

Alternative 1

No units harvested. Visual disturbance is unchanged.

Alternative 4

253 acres harvested and 5 miles of road constructed. Visual disturbance changes from low to high.

Alternative 6

96 acres harvested and 2 miles of road constructed. Visual disturbance remains low.

Alternative 10

100 acres harvested and 3 miles of road constructed. Visual disturbance remains low.

10. RIO ROBERTS WATERSHED

Alternative 1

No units harvested or roads constructed. Watershed functions, water quality, fisheries habitat maintained. Ability to function as an undesignated control watershed completely maintained.

Alternative 4

654 acres harvested and 10 miles of road constructed. Watershed functions, water quality, fisheries habitat maintained by unit and road design and BMP implementation. Ability to function as unofficial control watershed significantly reduced.

Alternative 6

365 acres harvested and 5 miles of road constructed to access units outside of watershed. Watershed functions, water quality, fisheries habitat maintained. Ability to function as unofficial control watershed moderately reduced.

Alternative 10

26 acres harvested and 1.5 miles of road constructed. Watershed functions, water quality, fisheries habitat maintained by unit and road design and BMP implementation. Ability to function as unofficial control watershed maintained.

11. RIO ROBERTS LATE-SUCCESSIONAL CORRIDOR

Alternative 1

No units harvested or roads constructed. Ability to function as a corridor maintained.

Alternative 4

177 acres harvested and 2 miles of road constructed. Ability to function as a corridor slightly reduced.

Alternative 6

74 acres harvested and 1 mile of road constructed. Ability to function as a corridor maintained.

Alternative 10

No units harvested or roads constructed. Ability to function as a corridor maintained.

12. RIO ROBERTS RESEARCH NATURAL AREA

Alternative 1

No units harvested or roads constructed. Ability to function as an RNA maintained.

Alternative 4

No units harvested or roads constructed. Ability to function as an RNA maintained.

Alternative 6

No units harvested or roads constructed. Ability to function as an RNA maintained.

Alternative 10

No units harvested or roads constructed. Ability to function as an RNA maintained.

13. ANGEL LAKE LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor maintained.	59 acres harvested and 1 mile of road constructed. Ability to function as a corridor maintained.	51 acres harvested and 1 mile of road constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.

14. BALLS LAKE LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.	184 acres harvested and 2 miles of road constructed. Ability to function as a corridor slightly reduced.	No units harvested or roads constructed. Ability to function as a corridor maintained.

15. KOGISH MOUNTAIN LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor and a small old growth block maintained.	217 acres harvested and 3 miles of road constructed. Ability to function as a corridor maintained. Ability to function as a small old growth block maintained.	141 acres harvested and 3 miles of road constructed. Ability to function as a corridor maintained. Ability to function as a small old growth block maintained.	No units harvested or roads constructed. Ability to function as a corridor and a small old growth block maintained.

16. WESTERN PENINSULA

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to provide old-growth habitat, and provide for subsistence resources is maintained.	No units harvested or roads constructed. Ability to provide old-growth habitat, and provide for subsistence resources is maintained.	263 acres harvested and 12 miles of road constructed. Ability to provide old-growth habitat, and provide for subsistence resources is slightly reduced.	No units harvested or roads constructed. Ability to provide old-growth habitat, and provide for subsistence resources is maintained.

17. ELEVEN MILE LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.	19 acres harvested and 2 miles of road constructed. Ability to function as a corridor maintained.	No units harvested or roads constructed. Ability to function as a corridor maintained.

18. ELEVEN MILE BLOCK

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance.	No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance.	61 acres harvested and 1 mile of road constructed. Ability to function as a small old growth block maintained. No change in visual disturbance.	No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance.

19. WESTERN SHORELINE LATE-SUCCESSIONAL CORRIDOR

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a corridor maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a corridor maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a corridor maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a corridor maintained. No change in visual disturbance. No effect to cultural resources.

20. SALT LAKE BAY BLOCK

Alternative 1	Alternative 4	Alternative 6	Alternative 10
No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance. No effect to cultural resources.	No units harvested or roads constructed. Ability to function as a small old growth block completely maintained. No change in visual disturbance. No effect to cultural resources.

3.0 ENVIRONMENTAL EFFECTS

This section provides the scientific and analytic basis for comparison of the alternatives presented in Section 2.0. It presents the expected effects on the physical, biological, social, and economic environments associated with implementation of these alternatives.

3.1 CLIMATE AND AIR QUALITY

All of the management alternatives are expected to have limited, short-term impact on the ambient air quality. Alternative 10 would result in the least emission of particulate and gaseous air pollutants in the near term. The potential for uncontrolled forest fires eventually might be increased under these alternatives, and the levels of air pollution that would result are likely to be comparable to those associated with other alternatives.

Local sources of airborne particulates produced or increased by the action alternatives include motor vehicle emissions, dust from road construction and motor vehicle traffic, residential and commercial heating sources, marine traffic, and the Ketchikan Pulp Company mill at Ward Cove. No prescribed burning is proposed in any alternative so there will be no effect on air quality from this source. Fugitive dust generated from road construction and increased vehicular traffic may temporarily affect air quality.

The action alternatives would result in a continued supply of raw wood products to the Ketchikan Pulp Company (KPC) mill at Ketchikan. This would indirectly affect air quality in the vicinity of Ketchikan. It is KPC's responsibility to ensure that emissions from the mill are within legal limits.

The direct and cumulative effects of the proposed action alternatives upon air quality will be a continuation of the existing local ambient air quality.

3.2 GEOLOGY

Timber harvest would have no direct effect on the area's mineral resources. Timber harvest and road building in all alternatives will improve the opportunity for mapping and prospecting for new deposits. No evidence of claims, current or abandoned, was found during the field work. In the event that claim monuments or boundaries are encountered during harvest they will be protected and mapped for future reference.

Project specific effects of harvest on karst areas for Alternatives 4, 6, and 10 are shown in Table 3.2-1. Table 3.2-1 shows the acres of karst and the miles and acres of proposed roads on karst areas by alternative. Alternative 4 and 6 result in similar area (9 and 10 acres, respectively) and miles of road (0.8 and 0.7 mile, respectively) on karst land. Alternative 10 avoids karst areas completely. Actual effects to karst and cave resources would be minimized by site specific mitigation measures.

Table 3.2-1. Environmental Consequences of Alternatives on Karst Areas

Item	Units	Alternatives		
		4	6	10
Harvest Units	acres (percent of total harvest area)	9 (0.20%)	10 (0.25%)	0
Road	miles	0.8	0.7	0
	acres ^{1/} (percent of total harvest area)	7 (0.15%)	6 (0.15%)	0

^{1/} Acres calculated for 75-foot standard road width.

3.3 SOILS

SOIL DISTURBANCE (DISPLACEMENT)

Table 3.3-1 shows potential acres of soil disturbance based on acres harvested and logging system. Alternative 4 has the highest value, followed by Alternatives 6 and 10. All values are below the 15 percent soil disturbance threshold (detrimental displacement) established in FSH 2500.

ROAD CONSTRUCTION ACREAGE

Table 3.3-2 shows the acres of road-associated disturbance, including quarries and landings, for the alternatives. Alternative 4 has the highest acreage of road-associated disturbance followed closely by Alternatives 6 and 10.

SURFACE EROSION

Soil disturbance makes increased surface erosion possible. As stated under soil disturbance Alternative 6 has the most acres disturbed while Alternative 10 has the least.

LANDSLIDES

The acreage of management activity on high MMI soils quantifies the areas most sensitive to mass movement. Table 3.3-3 shows by watershed the acreages of timber harvest on high MMI soils. Alternative 4 has the highest acreage of high MMI harvest followed by Alternatives 6 and 10. These acreages amount to 47, 56, and 46 percent of each individual alternative's acreage (for Alternatives 4, 6, and 10, respectively).

Table 3.3-1. Estimated Soil Disturbance by Watershed (in Acres)

Name	Watershed	Alt. 4	Alt. 6	Alt. 10
	000Z			
	BT2A		0	
	BT9A			
103-70-03	BW1A			
103-80-56	BW2A			
	BW3A			
Hatchery Creek	C20D	50	21	0
Logjam Creek	C21C	40	43	0
	C49B.0001	3	3	
Goose Creek	C49B.10,.11,.12	15	22	17
Control Creek	C49B.20,.24,.25,.26	35	2	1
Rio Beaver	C49B.21	43	39	38
Rio Roberts	C49B.22	44	27	2
Upper Thorne R.	C49B.23	40	18	0
North Thorne R.	C49B.27	0	0	0
Steelhead Creek	C95B	26	40	35
Election Creek	C96A	0	6	0
Shinaku Creek	D03B	28	13	7
103-60-05	D08A	0	16	0
11 Mile Creek	D09A.0100			
Goodrow Creek	D10A			
	D12A.0001		1	
Nossuk Creek	D12A.01	0	0	0
103-80-46	D14A			
103-80-50	D15A			
James Creek	D16A			
	TOTAL	324	251	101

Table 3.3-2. Proposed Road Acreage by Watershed

Name	Watershed	Alternative 4	Alternative 6	Alternative10
	BT2A	0	0	0
103-70-03	BW1A	0	0	0
103-80-56	BW2A	0	0	0
Hatchery Creek	C20D	134	50	0
Logjam Creek	C21C	113	130	0
N. Thorne River	C45D, C49B.270	0	0	0
	C49B.0001	5	5	0
Goose Creek	C49B.10,.11, .12	28	53	33
Control Creek	C49B.20,.24,.25,.	106	8	2
Rio Beaver	C49B.2100	76	72	75
Rio Roberts	C49B.2200	106	62	15
Upper Thorne R.	C49B.2300	70	29	0
Paul Young Cr.	C72A	0	2	2
Black Bear Cr.	C93A	0	0	0
Steelhead Creek	C95B	51	124	87
Election Creek	C96A	0	21	0
Staney Creek	C97C, C99C	8	8	7
Shinaku Creek	D03B	62	32	24
103-60-05	D08A	0	69	0
11 Mile Creek	D09A	0	0	0
Goodrow Creek	D10A	0	0	0
	D12A.0001	0	12	0
Nossuk Creek	D12A.01	0	24	0
103-80-44	D13A	0	0	0
103-80-46	D14A	0	0	0
103-80-50	D15A	0	0	0
James Creek	D16A	0	0	0
	TOTAL ACRES	760	703	245

Table 3.3-3. Acreage of Harvest Units on High MMI Soils

Name	Watershed	Alt. 4	Alt. 6	Alt. 10
	BT2A	0	0	0
	BT9A	0	0	0
103-70-03	BW1A	0	0	0
103-80-56	BW2A	0	0	0
Hatchery Creek	C20D	318	387	0
Logjam Creek	C21C	264	297	0
	C49B.0001	3	3	0
Goose Creek	C49B.10,.11,.12	101	132	94
Control Creek	C49B.20,.24,.25,.	129	108	10
Rio Beaver	C49B.2100	229	207	196
Rio Roberts	C49B.2200	434	231	20
Upper Thorne R.	C49B.2300	203	82	0
N. Thorne R.	C49B.2700	0	0	0
Steelhead Creek	C95B	264	441	232
Election Creek	C96A	0	45	0
Shinaku Creek	D03B	209	95	37
103-60-05	D08A	0	160	0
11 Mile Creek	D09A.0100	0	0	0
Goodrow Creek	D10A	0	0	0
	D11A	0	0	0
	D12A.0001	0	11	0
Nossuk Creek	D12A.01	0	44	0
103-80-44	D14A	0	0	0
103-80-46	D15A	0	0	0
103-80-50	D16A	0	0	0
	TOTAL	2,154	2,242	588
% of Total Alternative Acres		47%	56%	46%

3.4 WETLANDS, FLOODPLAINS, AND RIPARIAN AREAS

WETLANDS

The acreage of wetlands harvested by watershed for the alternatives is shown in Table 3.4-1. Alternative 4 has the most calculated muskeg inclusions followed by Alternatives 6 and 10. Field verification indicates that muskeg inclusions are less than 5 acres within any individual harvest unit. Forested wetlands within harvest units range from 1,685 acres to 597 acres. Alternative 4 has the most forested wetlands followed by Alternatives 6 and 10.

Table 3.4-2 shows the acres of fill associated with road construction by wetland type by alternative. Alternative 4 has the highest acreage followed by Alternatives 6 and 10. BMP implementation will maintain the values and functions of these wetlands.

ESTUARIES

Very small amounts of sediment would be delivered to any estuaries as a result of these alternatives. The small amount of extra sediment delivered because of road construction and timber harvest would have minimal biological effects and would not adversely affect biotic populations.

FLOODPLAINS

Table 3.4-3 shows the number of road crossings of Class I stream floodplains by watershed for the alternatives. The total number of floodplain crossings range from 16 to 5. Steelhead Creek has 5 crossings in Alternative 6 and 4 crossings in Alternatives 4 and 10.

RIPARIAN MANAGEMENT AREAS

The amount of riparian management area harvested by stream class, lakes, floodplains, and very high hazard soils (MMI4) are shown in Table 3.4-4. Alternatives 4 and 6 have similar and the largest number of harvest acres in riparian management areas. Considering all alternatives Shinaku Creek (D03B) has the largest number of acres (140) of harvest within the riparian management area. This value is for Alternative 4.

Table 3.4-1. Wetlands Associated with Harvest Units by Alternative and Watershed (in Acres)

Name	Watershed	Alt. 4 TOTAL	Alt. 6 TOTAL	Alt. 10 TOTAL
	000Z	0	0	0
103-80-37	BT2A	0	6	0
	BT9A	0	0	0
103-70-03	BW1A	0	0	0
103-80-56	BW2A	0	0	0
103-80-53	BW3A	0	0	0
Hatchery CK	C20D	344	191	0
Logjam Ck	C21C	416	448	0
North Thorne Riv	C45D,C49B.27	0	0	0
Thorne River	C49B,C45D	1058	665	366
	C49B.0001	27	27	0
Goose Ck	C49B.10,.11,.12	84	130	104
Control Ck	C49B.20,.24,.25,.	256	80	1
Rio Beaver	C49B.2100	254	228	253
Rio Roberts	C49B.2200	89	66	7
Upper Thorne Riv	C49B.2300	349	135	0
Paul Young Ck	C72A	0	0	0
Black Bear Ck	C93A	0	0	0
Steelhead ck	C95B	225	404	232
Election Ck	C96A	0	28	0
Staney Ck	C97C,C99C,B59	0	0	0
Shinaku Ck	D03B	170	109	118
103-60-05	D08A	0	37	0
11 Mile Ck	D09A	0	0	0
Goodrow Ck	D10A	0	0	0
	D11A	0	0	0
Nossuk River	D12A.01	0	52	0
	D12A.0001	0	10	0
103-80-46	D14A	0	0	0
103-80-50	D15A	0	0	0
James Ck	D16A	0	0	0
Total Forested Wetlands		1685	1550	597
Total Muskeg		529	399	119
Total Wetlands		2213	1949	716

Table 3.4-2. Road Construction on Wetlands by Alternative and Watershed (in Acres)

Name	Watershed	Alt. 4 TOTAL	Alt. 6 TOTAL	Alt.10 TOTAL
103-80-37	BT2A	0	0	0
103-70-03	BW1A	0	0	0
103-80-56	BW2A	0	0	0
Hatchery CK	C20D	0	24	0
Logjam Ck	C21C	95	110	0
North Thorne River	C45D,C49B.2700	0	0	0
Thorne River	C49B,C45D	208	130	34
	C49B.0001	5	5	0
Goose Ck	C49B.10,.11,.12	18	40	25
Control Ck	C49B.20,.24,.25,.	58	7	1
Rio Beaver	C49B.2100	47	47	0
Rio Roberts	C49B.2200	36	19	9
Upper Thorne River	C49B.2300	44	12	0
Paul Young Ck	C72A	0	2	2
Black Bear Ck	C93A	0	0	0
Steelhead ck	C95B	31	82	62
Election Ck	C96A	0	17	0
Staney Ck	C97C,C99C,B59C	4	4	4
Shinaku Ck	D03B	25	15	19
103-60-05	D08A	0	41	0
11 Mile Ck	D09A	0	0	0
Goodrow Ck	D10A	0	0	0
	D11A	0	0	0
Nossuk River	D12A.01	0	17	0
	D12A.0001	0	11	0
103-80-44	D13A	0	0	0
103-80-46	D14A	0	0	0
103-80-50	D15A	0	0	0
James Ck	D16A	0	0	0
Total Forested Wetlands		235	283	82
Total Muskeg		128	170	39
Total Wetlands		363	453	121

Table 3.4-3. Number of Floodplain Road Crossings of Class I Streams by Alternative

Watershed		Alt. 4	Alt. 6	Alt. 10
	BW1A			
	C20D.01	1		
Logjam Creek	C21C.04	3	3	
Goose Creek	C49B.10	1	2	1
Control Creek	C49B.20	1		
	C49B.22	1	1	
Upper Thorne R.	C49B.23	1		
North Thorne R.	C49B.27			
Steelhead Creek	C95B	4	5	4
Shinaku Creek	D03B	1	2	
103-60-05	D08A.01		2	
11 Mile Creek	D09A.01			
Nossuk River	D12A.01		1	
	Total	13	16	5

Table 3.4-4. Riparian Management Area Harvested by Stream Class and Watershed (in Acres)^{1/}

Name	Watershed	Alternative 4				Lake	MM14	Total
		Riparian Soil Acres	Class I Stream	Class II Stream	Class III Stream			
	000Z	0						0
	BT9A	0						
	BW1A	0						
	BW2A	0						
Hatchery CK	C20D	0	1	2	49	0		52
Logjam Ck	C21C	0	1	2	47			51
	C26C	0						
North Thorne River	C45D,C49B,2700	0						
Thorne River	C49B,C45D	0	17	7	283	40		347
	C49B.0001	0	0					0
Goose Ck	C49B.10,.11,.12	0	1	0	3	7		10
Control Ck	C49B.20,.24,.25,.26	0	6	1	42	27		75
Rio Beaver	C49B.2100	0	6	2	87	6		100
Rio Roberts	C49B.2200	0	1	0	67			68
Upper Thorne River	C49B.2300	0	3	4	85			93
Paul Young Ck	C72A	0						
Anderson Ck	C73C	0						
Black Bear Ck	C93A	0						
Steelhead ck	C95B	0	5	0	57			62
Election Ck	C96A	0						
Staney Ck	C97C,C99C,B59C	0						
Shinaku Ck	D03B	0	1	1	137			140
	D08A	0						
11 Mile Ck	D09A	0						
Goodrow Ck	D10A	0						
Nossuk River	D12A.01	0						
	D12A.0001	0						
	D14A	0						
	D15A	0						
James Ck	D16A	0						
TOTAL		0	26	12	574	40	0	651

^{1/} Harvest in Class I RMA is selective harvest outside TTRA 100 foot buffer.

Table 3.4-4. Riparian Management Area Harvested by Stream Class and Watershed (in Acres)^{1/}

Name	Watershed	Alternative 6				Lake	MM14	Total
		Riparian Soil Acres	Class I Stream	Class II Stream	Class III Stream			
	000Z	0						
	BT9A	0						
	BW1A	0						
	BW2A	0						
Hatchery CK	C20D	0	1	1	46			47
Logjam Ck	C21C	0	1	3	48	12		63
	C26C	0						
North Thorne River	C45D,C49B.2700	0						
Thorne River	C49B,C45D	0	4	0	264	5		272
	C49B.0001	0	0					0
Goose Ck	C49B.10,.11,.12	0	2	0	3	5		10
Control Ck	C49B.20,.24,.25,.26	0	0	0	44			44
Rio Beaver	C49B.2100	0	0	0	97			97
Rio Roberts	C49B.2200	0	1	0	46			47
Upper Thorne River	C49B.2300	0	0	0	73			73
Paul Young Ck	C72A	0						
Anderson Ck	C73C	0						
Black Bear Ck	C93A	0						
Steelhead ck	C95B	0	9	0	112			121
Election Ck	C96A	0		0	20			20
Staney Ck	C97C,C99C,B59C	0						
Shinaku Ck	D03B	0	1	0	60			61
	D08A	0	2	1	26			29
11 Mile Ck	D09A	0						
Goodrow Ck	D10A	0						
Nossuk River	D12A.01	0	1		20			21
	D12A.0001	0			0			0
	D14A	0						
	D15A	0						
James Ck	D16A	0						
TOTAL		0	19	5	595	16	0	635

1/ Harvest in Class I RMA is selective harvest outside TTRA 100 foot buffer.

Table 3.4-4. Riparian Management Area Harvested by Stream Class and Watershed (in Acres)^{1/}

Name	Watershed	Alternative 10				Lake	MMI4	Total
		Riparian Soil Acres	Class I Stream	Class II Stream	Class III Stream			
	000Z	0						
	BT9A	0						
	BW1A	0						
	BW2A	0						
Hatchery CK	C20D	0						
Logjam Ck	C21C	0						
	C26C	0						
North Thorne River	C45D,C49B.2700	0						
Thorne River	C49B,C45D	0	3	0	71	9		82
	C49B.0001	0						
Goose Ck	C49B.10,.11,.12	0	3		3	2		8
Control Ck	C49B.20,.24,.25,.26	0				4		4
Rio Beaver	C49B.2100	0	0	0	59	2		62
Rio Roberts	C49B.2200	0			8			8
Upper Thorne River	C49B.2300	0						
Paul Young Ck	C72A	0						
Anderson Ck	C73C	0						
Black Bear Ck	C93A	0						
Steelhead ck	C95B	0	6	0	88			94
Election Ck	C96A	0						
Staney Ck	C97C,C99C,B59C	0						
Shinaku Ck	D03B	0		0	56			56
	D08A	0						
11 Mile Ck	D09A	0						
Goodrow Ck	D10A	0						
Nossuk River	D12A.01	0						
	D12A.0001	0						
	D14A	0						
	D15A	0						
James Ck	D16A	0						
TOTAL		0	9	0	214	9	0	232

^{1/} Harvest in Class I RMA is selective harvest outside TTRA 100 foot buffer.

STREAM BUFFERS AND BMPS

Stream buffer and BMP information from field verification are shown in Tables 3.4-5 and 3.4-6. Table 3.4-5 summarizes information on the length of 100-foot TTRA and extended width stream buffers by stream class and alternative. Table 3.4-6 summarizes information on the lengths of Class III streams that would be harvested to streambank and that received a no-harvest buffer. Alternative 4 has the greatest amount of buffers applied to Class I, II, and III streams followed by Alternatives 6 and 10.

Table 3.4-5. Lengths (in Miles) of Stream Buffer

	100-foot TTRA Buffer		Extended with Buffer	
	One Side	Two Side	One Sided	Two Sided
Alternative 4				
Class I	22.7	1.5	4.2	0.0
Class II	7.7	4.5	1.3	1.5
Alternative 6				
Class I	14.1	0.7	2.6	0.0
Class II	5.5	2.7	0.3	1.1
Alternative 10				
Class I	4.6	0.4	0.8	0.0
Class II	1.7	1.1	0.1	1
Total Project Area	Class I miles	434.8		
	Class II miles	200.1		

Table 3.4-6. Lengths of Class III Stream (in Miles) Treated with Best Management Practices (BMP's) by Alternative

Alternative	BMP's Excluding No-Cut Buffers		BMP's Including No-Cut Buffers of Variable Widths	
	One Side	Two Side	One Sided	Two Sided
4	13.4	27.9	2.7	1.6
6	11.2	28.3	2.3	1.4
10	3.5	10.7	0.8	1.3
Total Project Area Class III Streams in miles 584.8.				

3.5 WATER, FISH, AND FISHERIES

WATER RESOURCES HYDROLOGY

No significant adverse effects on watershed hydrology are anticipated for these alternatives. Harvest rates in alternatives are below the thresholds where increases or decreases in streamflow would be expected.

WATER QUALITY—STREAM SEDIMENT

Harvest Units

Two approaches were used to estimate the amount of surface erosion. First the acres of soil disturbance was estimated based on logging method. The acres of potential disturbance for harvest units by watershed based on this approach are shown in Table 3.3-1.

The second approach evaluated potential sediment delivery generated in harvest units. This approach is discussed in Chapter 4, *Water, Fish and Fisheries*. The data from this approach is shown in Table 3.5-1. This table shows that Alternative 2 has the highest potential while Alternative 10 has the least potential for sediment effects.

Table 3.5-1. Sediment Delivery Potential of Harvest Units for the Alternatives

	Alternative 4	Alternative 6	Alternative 10
Sediment Delivery Index ^{1/}	583	519	181

1/ This index was developed based on such factors as the number of streams, proximity to Class I streams, slope steepness, sediment potential, and logging system. Each unit was ranked and results tabulated. Details of this procedure are contained in Jackson 1995 and Rogers and Ablow 1995.

ROAD EROSION

Three methods are used to evaluate the alternatives and their relative risk of sediment delivery to streams. First is the acres of new road proposed. Second is the number of proposed road crossings of streams. Third is an evaluation of the specific potential for sediment delivery to streams of all harvest units and roads. These approaches are discussed in Chapter 4, *Water, Fish and Fisheries*.

Table 3.3-2 shows the acres of new road proposed by major watershed including quarries and landings. Watersheds with the highest road acreage have the greatest susceptibility for potential road-related sediment delivery. The table shows that Alternative 4 has the highest acres of new roads followed by Alternatives 6 and 10.

The number of road crossings is shown in Table 3.5-2. These data show that Alternative 4 has the highest total number of stream crossings (246 or approximately 2.6 stream crossings per mile of road), and the highest potential risk of sediment delivery to streams.

The results of the potential sediment delivery analysis for roads is shown in Table 3.5-3. The methodology and interpretation for this data are the same as presented in Chapter 4, Water, Fish, and Fisheries section. Alternative 6 has the highest sediment delivery potential at 14,996. It is followed by Alternatives 4 and 10 with sediment delivery potentials of 14,796 and 6,728.

WATER CHEMISTRY

Significant alterations to water chemistry as a result of timber harvest are not expected.

STREAM TEMPERATURE AND DISSOLVED OXYGEN

Timber harvesting in Class III streams is expected to have minimal effects on stream temperatures and dissolved oxygen. The potential effects on stream temperature were evaluated by considering the miles of vegetation removed along Class III streams in all timber harvest units (Table 3.4-6). These data quantify the total amount of stream channel subject to increased insolation and warming.

Vegetation removed along Class III streams ranges from 45.6 miles for Alternative 4 to 16.3 miles for Alternative 10 (Table 3.4-6). Most Class III streams in the Project Area are high gradient, contained channels with low water temperatures even in summer. These properties make them resistant to thermal increases. For these reasons, stream temperatures increases from removal of streamside vegetation along Class III streams in harvest units are unlikely.

Table 3.5-2. Number of Road Crossings of Class I, II, and III Streams by Alternatives and Watersheds

Name	Watershed	Alternative 4				Alternative 6				Alternative 10			
		Class I	Class II	Class III	Total	Class I	Class II	Class III	Total	Class I	Class II	Class III	Total
103-80-42	BT2A				0				0				0
	BW1A				0				0				0
	BW2A				0				0				0
Hatchery Ck	C20D		6	21	27			7	7				0
Logjam Ck	C21C	8	12	25	45	8	12	25	45				0
North Thorne River	C45D,C49B,2700				0				0				0
Thorne River	C49B,C45D				0				0				0
	C45D				0				0				0
	C49B				0				0				0
	C49B.0001				0				0				0
Goose Ck	C49B.10,,11,,12	1		1	2	2	2	3	7	1	2	3	6
Control Ck	C49B.20,,24,,25,,26	8	8	18	34	2	2		4				0
Rio Beaver	C49B.2100	1	1	18	20	1	1	19	21		1	9	10
Rio Roberts	C49B.2200	2	2	24	28	2	1	11	14			4	4
Upper Thorne River	C49B.2300	5	3	21	29			14	14				0
Paul Young Ck	C72A				0	1			1				1
Anderson Ck	C73C				0				0				0
Black Bear Ck	C93A				0				0				0
Steelhead ck	C95B		4	10	14	6	10	49	65	5	9	27	41
Election Ck	C96A				0			7	7				0
Staney Ck	C97C,C99C,B59C	3			3	3			3	3			3
Shinaku Ck	D03B	3	9	32	44	3	6	10	19	1	7	11	19
103-60-05	D08A				0	8	6	4	18				0
11 Mile Ck	D09A				0				0				0
Goodrow Ck	D10A				0				0				0
Nossuk River	D12A.01				0	3		2	5				0
	D12A.0001				0		4		4				0
103-80-44	D13A				0				0				0
103-80-50	D14A				0				0				0
	D15A				0				0				0
James Ck	D16A				0				0				0
TOTAL		31	45	170	246	39	44	151	234	11	19	54	84

Table 3.5-3. Sediment Delivery Potential of Roads by Alternative

	Alternative 4	Alternative 6	Alternative 10
Sediment Delivery Index ^{1/}	14,796	14,983	6,728

Source: Jackson 1995.

1/ This index was developed based on the number of stream crossings and assumed truck traffic. Each road segment was ranked and the results tabulated. Details of the procedure are contained in Jackson 1995 and Rogers and Ablow 1995.

CONSUMPTIVE WATER USE

Timber harvest will not have any impact on the availability of water to those sites in the Project Area where consumptive water use occurs.

DIRECT AND INDIRECT EFFECTS TO FISHERIES

Because of mitigative actions taken and planned for implementation, no anticipated significant impacts will occur to fisheries resources from any of the alternatives. Actions taken that have effects on fish include removal of riparian vegetation, increased sediment inputs to streams, temperature and dissolved oxygen changes, changes in inputs of large woody debris (LWD), and miscellaneous actions related to road construction. All of the alternatives have some associated risk of effects to streams and fisheries resources; the magnitude of the risk is proportional to the extent of application of stream buffer prescriptions and BMP's, the miles of new or reconstructed road, and the number of stream crossings required. All of these data have been presented above for Alternatives 4, 6, and 10. In these cases, Alternative 4 has the highest level of impact and, consequently, the highest level of risk to fisheries resources.

CUMULATIVE EFFECTS

Table 3.5-4 shows the cumulative acreage harvested in the last 15 years by third order and larger watersheds for Alternatives 4, 6, and 10. An acreage greater than 35 percent harvest in that time period is not allowed. Watershed BS7A, located north of the Nossuk River on the Western Peninsula, exceeds the 35 percent limit from previous harvest that occurred within this watershed. No additional harvest is planned in this 401-acre watershed for this entry. At the maximum level of harvest for these

Table 3.5-4. Cumulative Ground Disturbing Activities (% of Total Area) by Major Watershed and Alternative

Name	Watershed	Total Watershed Acres	Previously Harvested Acres	Percent Previously Harvested	Alt. 4 Percent Harvested	Alt. 6 Percent Harvested	Alt. 10 Percent Harvested
103-80-37	BS7A	401	141.7	35.3	35.3	35.3	35.3
	BT2A	459	60.9	13.3	13.3	14.9	13.3
	BT6A	803	0.0	0.0	0.0	0.0	0.0
103-80-42	BW1A	599	0.0	0.0	0.0	0.0	0.0
	BW5A	489	0.0	0.0	0.0	0.0	0.0
Hatchery Creek	C20D	19,247	707.1	3.7	6.8	6.3	3.7
Logjam Creek	C21C	54,969	7093.8	12.9	13.9	14.0	12.9
	C26C	10,462	788.5	7.5	7.5	7.5	7.5
N. Thorne River	C45D,C49B.2700	22,110	1521.6	6.9	6.9	6.9	6.9
Thorne River	C49B,C45D	106,338	6666.8	6.3	8.7	7.9	6.3
Goose Creek	C49B.10,.11,.12	13,726	1652.4	12.0	13.2	13.9	13.5
Control Creek	C49B.20,.24,.25,.26	21,429	672.6	3.1	5.6	3.7	3.2
Rio Beaver	C49B.2100	8,979	412.6	4.6	11.1	10.6	10.1
Rio Roberts	C49B.2200	8,758	68.7	0.8	8.9	5.7	1.1
Upper Thorne R.	C49B.2300	16,800	389.3	2.3	5.9	4.5	2.3
East Goose Ck.	C70A	4,870	848.2	17.4	17.4	17.4	17.4
Paul Young Ck.	C72A	4,165	0.0	0.0	0.0	0.0	0.0
Anderson Ck.	C73C	21,790	230.7	1.1	1.1	1.1	1.1
	C74B	17,320	0.0	0.0	0.0	0.0	0.0
	C92A	735	0.0	0.0	0.0	0.0	0.0
Black Bear Ck.	C93A	11,436	750.7	6.6	6.6	6.6	6.6
Steelhead Creek	C95B	20,670	2930.7	14.2	15.7	17.0	16.1
Election Creek	C96A	6,285	846.7	13.5	13.5	14.7	13.5
Staney Creek	C97C,C99C,B59C	48,821	5319.5	10.9	10.9	10.9	10.9
	D01B	8,817	461.5	5.2	5.2	5.2	5.2
Shinaku Creek	D03B	16,590	464.0	2.8	5.4	4.1	3.8
103-60-25	D04A	2,339	556.7	23.8	23.8	23.8	23.8
103-60-07	D07A	1,797	126.5	7.0	7.0	7.0	7.0
103-60-05	D08A	8,400	9.2	0.1	0.1	2.2	0.1
11 Mile Ck	D09A	4,105	0.0	0.0	0.0	0.0	0.0
Goodrow Creek	D10A	1,143	0.0	0.0	0.0	0.0	0.0
	D12A.01	4,973	398.9	8.0	8.0	9.3	8.0
Nossuk River	D12A.0001	1,107	77.2	7.0	7.0	8.4	7.0
103-80-44	D13A	995	0.0	0.0	0.0	0.0	0.0
103-80-50	D14A	1,809	0.0	0.0	0.0	0.0	0.0
	D15A	2,423	0.0	0.0	0.0	0.0	0.0
	D16A	1,178	0.0	0.0	0.0	0.0	0.0
	Project Area TOTAL	370,999	26530	7.2	8.4	8.2	7.5

alternatives the following watersheds have the greatest percent harvest (percent in parentheses): Steelhead Creek (17), 103-80-37 (14.9), Logjam Creek (14), Goose Creek (13.9), and Rio Beaver (11.1).

Table 3.5-5 shows the cumulative acreage harvested in the riparian management areas of channel types HC1, HC2, HC3, HC4, HC5, HC6, HC8, and HC9 in third order and larger watersheds over a 20-year period. An acreage greater than 25 percent harvest in that time period is not allowed. At the maximum level of harvest for these alternatives the following watersheds have the greatest percent harvest (percent in parentheses): 103-80-37 (17), Election Creek (16.6), Logjam Creek (15.8), Rio Beaver (16.3), Steelhead Creek (12.7), and Nossuk River (12.4).

Table 3.5-5. Cumulative Harvest in Riparian Management Area for Channel Types for HC1, HC2, HC3, HC5, HC6, HC8, and HC9 by Major Watershed and Alternative (in Percent of Total Area)

NAME	WATERSHED	Total RMA Acres	Previously Harvested Acres	Alt. 4 Percent Harvest	Alt. 6 Percent Harvest	Alt. 10 Percent Harvest
	BS9A	1	0	0.0	0.0	0.0
103-80-37	BT2A	113	19	17.0	17.0	17.0
	BT5A	34	12	36.0	36.0	36.0
103-70-03	BW1A	40		0.0	0.0	0.0
103-80-42	BW5A	46		0.0	0.0	0.0
Hatchery Creek	C20D	1394	80	8.0	9.2	5.7
Logjam Creek	C21C	3886	573	15.8	15.8	14.7
	C26C	947	54	5.7	5.7	5.7
North Thorne R.	C45D,C49B.27	1095	139	12.7	12.7	12.7
Thorne River	C49B,C45D	7860	589	7.5	7.5	7.5
Goose Creek	C49B.10,.11,.12	1015	164	16.4	16.5	16.5
Control Creek	C49B.20,.24,.25,2	3039	39	2.7	2.8	1.3
Rio Beaver	C49B.2100	1189	104	16.0	16.3	13.1
Rio Roberts	C49B.2200	1042	8	7.2	5.1	1.5
Upper Thorne R.	C49B.2300	1228	21	8.6	7.5	1.7
East Goose Ck	C70A	408	146	35.7	35.7	35.7
Paul Young Ck.	C72A	146		0.0	0.0	0.0
Anderson Creek	C73C	1476	14	1.0	1.0	1.0
	C74B	876		0.0	0.0	0.0
Black Bear Ck.	C93A	1275	134	10.5	10.5	10.5
Steelhead Ck.	C95B	4201	424	11.3	12.7	12.1
Election Creek	C96A	1449	220	15.2	16.6	15.2
Staney Creek	C97C,C99C,B59C	6770	924	13.6	13.6	13.6
	D01B	1113	54	4.9	4.9	4.9
Shinaku Creek	D03B	2172	3	6.3	2.9	2.5
103-60-25	D04A	310	84	27.0	27.0	27.0
103-60-07	D07A	163	5	3.2	3.2	3.2
103-60-4	D08A	880		0.0	2.3	0.0
11 Mile Ck	D09A	317		0.0	0.0	0.0
Goodrow Creek	D10A	113		0.0	0.0	0.0
103-80-36	D12A.0001	128	11	8.4	8.5	8.4
Nossuk River	D12A	745	72	9.6	12.4	9.6
103-80-44	D13A	172		0.0	0.0	0.0
103-80-46	D14A	209		0.0	0.0	0.0
103-80-50	D15A	258		0.0	0.0	0.0
James Creek	D16A	157		0.0	0.0	0.0
Total Project Area		38409	3304	10.0	10.1	9.1

3.6 SILVICULTURE, TIMBER, & VEGETATION

DIRECT EFFECTS

Direct environmental effects are those occurring at the same time and place as the result of the implementation of one of the timber harvest action alternatives.

FOREST PLANT COMMUNITIES

Table 3.6-1 shows which plant series will be affected by the proposed harvest.

Table 3.6-1. Acres of Proposed Harvest by Plant Series and Alternative

Plant Series	Alt. 4	Alt. 6	Alt. 10
Western Hemlock	2,103	1,699	387
Sitka Spruce	11	11	0
Mixed Conifer	419	346	6
Mountain Hemlock	63	63	13
W. Hemlock/Redcedar	1,244	1,372	725
Muskeg	715	530	150
Total	4,555	4,021	1,281

Source: GIS query, USDA Forest Service, TNF

Road construction activities will affect the existing plant association series due to the removal of land area from timber productivity for the reasonably foreseeable future.

Table 3.6-2 shows the acres of road building on forested plant communities.

Table 3.6-3 shows the acres of road building on non-forested plant communities.

VOLUME CLASS

The number of acres proposed for harvest within each VCU and volume class; and the percentage of the existing Project Area volume class acreage that would be removed is

Table 3.6-2. Miles of Proposed Road Across Forested Plant Communities

Plant Series	Alt. 4	Alt. 6	Alt. 10
Western Hemlock	30.6	24.2	7.7
Sitka Spruce	0.4	0.3	0.1
Mixed Conifer	7.2	5.8	1.6
Mountain Hemlock	2.6	2.2	0.8
W. Hemlock/Redcedar	15.7	17.4	9.0
Total	56.5	50.2	19.3

Source: GIS query, USDA Forest Service, TNF

Table 3.6-3. Miles of Proposed Road Across Non-forested Vegetation Communities

Vegetation Series	Alt. 4	Alt. 6	Alt. 10
Muskeg vegetation	22.4	23.8	6.8
Alpine vegetation	0.0	0.0	0.0
Shrubland	0.0	0.0	0.0
Estuary Vegetation	0.0	0.0	0.0
Major river systems	0.0	0.0	0.0
Total	22.4	23.8	6.8

Source: GIS query, USDA Forest Service, TNF

shown in Tables 3.6-4 through 3.6-6 for Alternatives 4, 6, and 10. The existing volume class is based upon what is left on National Forest Land after full implementation of the 1989-94 EIS.

SITE CLASS

Table 3.6-7 shows the level of harvest that would occur within each Site Class category for Alternatives 4, 6, and 10.

PROPOSED HARVEST VOLUME

Table 3.6-8 displays an estimate of the total volume expected to be harvested for Alternatives 4, 6, and 10. The volume has been adjusted for partial cut retention levels as described in Chapter 3 (Silvicultural Harvest Methods).

PROPORTIONALITY ANALYSIS

For an Alternative to be considered acceptable, it must not show a reduction of acres in Volume Classes 6 and 7 beyond the percentage established by TTRA for each Management Area.

ACREAGE-BASED PROPORTIONALITY

The percentage change in proportionality from the existing acres are shown below for Alternatives 4, 6, and 10 in Table 3.6-9.

The results can be summarized as follows:

1. K08 remains above the base proportion
2. K14 is below the base proportion, but the proportion will be improved after implementation of any of the alternatives except for Alternative 4.
3. K15 drops below the base proportion with the harvest of Alternative 4.

Table 3.6-10 shows the acres that would need to be harvested by volume class, after implementation of an alternative, to return to the base proportion. For alternatives that are out of proportion (the "Change from Base" value was negative in Table 3.6-9) additional acres of volume class 4 and 5 would need to be harvested to return to the

Table 3.6-4. Volume Class Acreage Harvested by VCU for Alternative 4

VCU	Volume Class 4		Volume Class 5		Volume Class 6	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	251	6.8	254	7.9	38	3.8
575	147	3.7	324	6.6	76	4.0
576	105	4.6	276	8.9	92	6.6
577	110	3.9	318	12.1	86	10.6
578	11	1.1	10	1.0	4	0.4
591	0	0.0	0	0.0	0	0.0
592	0	0.0	0	0.0	0	0.0
593	0	0.0	0	0.0	0	0.0
594	233	8.3	158	8.2	0	0.0
595	116	4.1	64	2.7	84	4.1
596	150	8.2	208	11.2	301	23.2
597.1	27	9.0	15	3.0	12	2.8
597.2	175	5.2	401	10.2	14	1.4
Total	1,325	4.5	2,030	6.7	708	5.7

VCU	Volume Class 7		Undesignated*		Total	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	0	0.0	39	0.7	582	4.2
575	0	0.0	32	0.5	579	3.3
576	14	7.0	98	1.3	585	3.9
577	0	0.0	72	0.9	586	3.9
578	0	0.0	1	0.1	26	0.4
591	0	0.0	0	0.0	0	0.0
592	0	0.0	0	0.0	0	0.0
593	0	0.0	0	0.0	0	0.0
594	0	0.0	42	0.8	434	3.8
595	22	2.8	36	0.4	322	1.7
596	0	0.2	31	0.5	691	5.7
597.1	0	0.0	15	1.1	70	2.2
597.2	7	2.8	82	1.0	681	3.2
Total	44	1.3	449	0.5	4,555	2.7

Source: GIS query, USDA Forest Service, TNF

% of existing = % to be harvested from the existing volume class acreage in each VCU

* Includes areas which are not currently mapped with a volume class designation. These areas represent inclusions within or along the edges of harvest units that should be upgraded to VC 4 or higher based on ground verification.

Table 3.6-5. Volume Class Acreage Harvested by VCU for Alternative 6

VCU	Volume Class 4		Volume Class 5		Volume Class 6	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	376	10.2	130	4.0	16	1.6
575	57	1.4	197	4.0	50	2.6
576	16	0.7	35	1.1	0	0.0
577	131	4.7	315	12.0	98	12.2
578	11	1.1	10	1.0	4	0.4
591	21	2.1	19	1.4	0	0.0
592	0	0.0	0	0.0	0	0.0
593	42	2.3	121	6.7	0	0.0
594	124	4.4	134	6.9	0	0.0
595	230	8.2	188	7.8	115	5.6
596	89	4.8	155	8.4	210	16.2
597.1	0	0.0	0	0.0	0	0.0
597.2	234	6.9	407	10.4	45	4.5
Total	1,331	4.5	1,709	5.6	537	4.3

VCU	Volume Class 7		Undesignated*		Total	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	0	0.0	19	0.3	540	3.9
575	0	0.0	27	0.4	330	1.9
576	0	0.0	26	0.3	76	0.5
577	0	0.0	79	1.0	623	4.1
578	0	0.0	1	0.1	26	0.4
591	0	0.0	21	0.5	61	0.7
592	0	0.0	0	0.0	0	0.0
593	0	0.0	39	0.4	202	1.5
594	0	0.0	22	0.4	280	2.5
595	22	2.8	49	0.5	603	3.1
596	1	0.4	22	0.3	476	3.9
597.1	0	0.0	6	0.4	6	0.2
597.2	7	2.8	104	1.3	796	3.8
Total	30	0.9	415	0.5	4,021	2.4

Source: GIS query, USDA Forest Service, TNF

% of existing = % to be harvested from the existing volume class acreage in each VCU

* Includes areas which are not currently mapped with a volume class designation. These areas represent inclusions within or along the edges of harvest units that should be upgraded to VC 4 or higher based on ground verification.

Table 3.6-6. Volume Class Acreage Harvested by VCU for Alternative 10

VCU	Volume Class 4		Volume Class 5		Volume Class 6	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	0	0.0	0	0.0	0	0.0
575	0	0.0	0	0.0	0	0.0
576	6	0.3	0	0.0	0	0.0
577	0	0.0	0	0.0	0	0.0
578	0	0.0	0	0.0	0	0.0
591	0	0.0	0	0.0	0	0.0
592	0	0.0	0	0.0	0	0.0
593	0	0.0	0	0.0	0	0.0
594	84	3.0	68	3.5	0	0.0
595	173	6.2	142	5.9	12	0.6
596	0	0.0	25	1.4	0	0.0
597.1	35	11.9	0	0.0	5	1.1
597.2	203	6.0	312	7.9	30	3.1
Total	501	1.7	547	1.8	48	0.4

VCU	Volume Class 7		Undesignated*		Total	
	Harvest	% of Existing	Harvest	% of Existing	Harvest	% of Existing
574	0	0.0	0	0.0	0	0.0
575	0	0.0	0	0.0	0	0.0
576	0	0.0	8	0.1	14	0.1
577	0	0.0	0	0.0	0	0.0
578	0	0.0	0	0.0	0	0.0
591	0	0.0	0	0.0	0	0.0
592	0	0.0	0	0.0	0	0.0
593	0	0.0	0	0.0	0	0.0
594	0	0.0	7	0.1	159	1.4
595	20	2.6	41	0.4	389	2.0
596	0	0.0	1	0.0	26	0.2
597.1	0	0.0	17	1.2	57	1.8
597.2	7	2.8	84	1.0	636	3.0
Total	28	0.8	157	0.2	1,281	0.8

Source: GIS query, USDA Forest Service, TNF

% of existing = % to be harvested from the existing volume class acreage in each VCU

* Includes areas which are not currently mapped with a volume class designation. These areas represent inclusions within or along the edges of harvest units that should be upgraded to VC 4 or higher based on ground verification.

Table 3.6-7. Proposed Harvest Acreage in Each Site Class by Alternative

	Alt. 4	Alt. 6	Alt. 10
Very Low Site Index	710	551	105
Low Site Index	423	337	143
Medium Site Index	1,030	1,137	490
High Site Index	2,391	1,996	542
Total	4,555	4,021	1,281

Source: GIS query, USDA Forest Service, TNF

Table 3.6-8. Proposed Harvest Volume by Alternative

	Total Volume* (MBF)		
	Alt. 4	Alt. 6	Alt. 10
Total Volume	129,279	106,217	37,733

* Adjusted for retention level and 17% hidden defect, breakage, and utility deduction

Table 3.6-9. Effect of Alternative Harvest on Proportionality (Acreage-Based Method)

Time Period	Acres		Percent	Change from Base (%)
	VC 4-7	VC 6-7		
Management Area K08				
Dec. 31, 1990 (Base)	63,900	13,564	21.23	
Dec. 31, 1994	61,836	13,175	21.31	0.08
CPOW ROD	1,067	129		
Result	60,769	13,046	21.47	0.24
Alt. 4	1,597	204		
Result	60,186	12,935	21.49	0.26
Alt. 6	1,395	167		
Result	59,374	12,879	21.69	0.46
Alt. 10	0	0		
Result	60,769	13,046	21.47	0.24
Management Area K014				
Dec. 31, 1990 (Base)	46,322	6,893	14.88	
Dec. 31, 1994	45,085	6,369	14.13	-0.75
Alt. 4	650	106		
Result	44,435	6,263	14.09	-0.79
Alt. 6	1,021	136		
Result	44,064	6,233	14.15	-0.73
Alt. 10	499	32		
Result	44,586	6,337	14.21	-0.67
Management Area K015				
Dec. 31, 1994 (Base)	21,865	4,683	21.42	
Dec. 31, 1994	20,711	4,469	21.58	0.16
Alt. 4	1,795	442		
Result	18,916	4,027	21.29	-0.13
Alt. 6	1,194	263		
Result	19,517	4,206	21.55	0.13
Alt. 10	619	42		
Result	20,092	4,427	22.03	0.62

base proportion. For alternatives that are within proportion, Table 3.6-10 shows the additional acres of volume classes 6 and 7 that could be harvested and still remain within the required proportion.

PROPOSED HARVEST BY SILVICULTURAL SYSTEM

Table 3.6-11 summarizes the use of Project Area silvicultural systems for Alternatives 4, 6, and 10. The number of units utilizing the silvicultural system; of which some units use 2 or more, are shown along with the total number of acres in the alternative using the system.

PROPOSED HARVEST METHODS

Table 3.6-12 shows the distribution of proposed yarding systems for the alternatives. Running skyline is the dominant logging system proposed in all alternatives, followed by live skyline, slackline, shovel, and helicopter yarding. Alternative 4 has the smallest percentage of helicopter yarding with only three percent of the total harvest acreage. Alternative 10 has largest percentage of helicopter yarding with 15 percent of the total harvest acreage.

CUMULATIVE EFFECTS

This section summarizes the impacts of the Control Lake proposed harvest upon the environment in combination with the effects of past and proposed future actions.

PROJECTED HARVEST THROUGH 2004

Table 3.6-13 summarizes the total cumulative harvest within the Project Area for Alternatives 4, 6, and 10.

Table 3.6-14 represents the acreage base which is currently available to timber harvest for each action alternative. The percentage of forestland harvested reflects the cumulative harvest acreage falling within the suitable base.

Table 3.6-10. Acres of Harvest Needed to Return to Base Proportion (Acreage-Based Method)

Alternative	Acres	
	VC 4-5	VC 6-7
Management Area K08		
Alt. 4	--	358
Alt. 6	--	351
Alt. 10	--	186
Management Area K14		
Alt. 4	2,345	--
Alt. 6	2,176	--
Alt. 10	1,999	--
Management Area K15		
Alt. 4	114	--
Alt. 6	--	33
Alt. 10	--	157

Table 3.6-11. Acres Harvested by Silvicultural System and Alternative

	Alt. 4		Alt. 6		Alt. 10	
	Units	Acres	Units	Acres	Units	Acres
Clearcut ^{1/}						
Type A	62	2,591	60	2,304	18	740
Type B	34	1,142	22	639	13	309
Type C	5	114	6	161	3	93
Total Clearcut	96	3,847	86	3,104	33	1,141
Overstory Removal (Type E)	6	123	7	115	1	6
Seed Tree (Type F)	4	109	2	47	2	21
Shelterwood (Type G)	7	131	4	129	3	88
Shelterwood (Type H)	3	59	2	28	1	12
Uneven-aged Mgmt. (Type I)	18	286	12	598	4	13
Total ^{2/}	105	4,555	99	4,021	38	1,281

1/ Type D clearcut acreages are included under other harvest types.

2/ Number of units includes partial units.

Table 3.6-12. Distribution of Proposed Yarding System

Alternative	Highlead		Running Skyline		Live Skyline		Slackline		Helicopter		Shovel	
	acres	MBF	acres	MBF	acres	MBF	acres	MBF	acres	MBF	acres	MBF
4	600	15,645	1,541	35,550	1,041	36,839	834	25,072	176	3,796	362	7,210
	13%	13%	34%	29%	23%	30%	18%	20%	4%	3%	8%	6%
6	564	16,645	1,134	27,413	779	26,283	507	15,569	738	8,716	299	6,951
	14%	16%	28%	27%	19%	26%	13%	15%	18%	9%	7%	7%
10	308	9,536	338	9,054	195	7,051	181	5,063	177	5,919	81	1,954
	24%	25%	26%	23%	15%	18%	14%	13%	14%	15%	6%	5%

Table 3.6-13. Cumulative Harvest Through 2004: Control Lake Project Area

Alt.	Past Harvest 1940-1994	Control Lake Project Harvest Acres	Cumulative Harvest 1940-2004	Percent CFL Harvested*	Potential Harvest Acres 2002-2004
4	10,603	4,555	15,158	17.5	4,854
6	10,603	4,021	14,624	16.9	5,388
10	10,603	1,281	11,884	13.7	8,128

* Based upon 86,628 acres of CFL

Table 3.6-14. Control Lake Project Area Timber Supply Through 2004

	MA	Past Harvest on Suitable Base	Control Lake Proposed Harvest Acres	Percent Suitable Proposed	Cumulative Harvest 1940- 2004*	Percent Suitable Base Harvested**	Available Acres 2005-2054
Alt. 4	K08	2,340	1,773	11.6	4,113	26.9	11,185
	K14	2,093	756	4.9	2,849	18.3	12,705
	K15	4,222	2,026	11.8	6,248	36.4	10,900
	Total	8,655	4,555	9.5	13,210	27.5	34,790
Alt. 6	K08	2,340	1,519	9.9	3,859	25.2	11,439
	K14	2,093	1,147	7.4	3,240	20.8	12,314
	K15	4,222	1,355	7.9	5,577	32.5	11,571
	Total	8,655	4,021	8.4	12,676	26.4	35,324
Alt. 10	K08	2,340	0	0.0	2,340	15.3	12,958
	K14	2,093	548	3.5	2,641	17.0	12,913
	K15	4,222	733	4.3	4,955	28.9	12,194
	Total	8,655	1,281	2.7	9,936	20.7	38,064

* Past harvest on the suitable base totals 8,655 acres.

** The suitable base totals 48,000 acres.

3.7 WILDLIFE

WILDLIFE HABITATS

Alternatives 4, 6, and 10 would affect wildlife habitats by converting old-growth forests to different successional stages. Early successional habitats would be created by Type A through F silvicultural prescriptions, while Types G through I would have the appearance of partial cuts, with Type I retaining the highest level of structure (Table 3.7-1). No harvest would occur within the 500-foot Beach Fringe or 1,000-foot Estuary LUD's and no roads would be constructed through these areas. Harvest within Riparian Management Areas would primarily include riparian habitats associated with Class III streams and selective harvest areas associated with lakes (Table 3.7-2).

MANAGEMENT INDICATOR SPECIES

Anticipated changes in habitat capability under Alternatives 4, 6, and 10 for the Management Indicator Species (MIS) are measured against the current condition in Table 3.7-3. The number of harvest units in Alternatives 4, 6, and 10 affecting high-quality MIS habitat is displayed in Table 3.7-4 for each MIS. Change in habitat capability for most species ranges from -3 to -6 percent for Alternative 4, -3 to -4 percent for Alternatives 6, and -1 to -3 percent for Alternative 10. Habitat capability for the river otter and bald eagle does not change under any of the alternatives because riparian harvest along Class I and II streams and beach fringe/estuary harvest are avoided under all alternatives. The number of units affecting high-quality habitats for MIS is highest for most species under Alternative 4, and lowest under Alternative 10.

WILDLIFE POPULATION OBJECTIVES

The existing habitat capabilities (1995) within WAA's 1318 and 1323 are above the minimum required to sustain the average documented historical deer harvest. As stated in Chapter 3 of this EIS, WAA's 1319 and 1421 are currently below the proposed population objectives. Habitat capabilities in all WAA's would be reduced with harvest of an action alternative. WAA's 1319 and 1421 would fall further below the population objective, but WAA's 1318 and 1323 would continue to exceed the objective under all alternatives (Table 3.7-5). For a complete discussion of subsistence resources, refer to the *Subsistence* section of this Appendix.

Table 3.7-1. Proposed Silvicultural Treatments

Silvicultural Treatment	Harvest Type	% Volume Retained	% of Acres Proposed for Harvest		
			Alt. 4	Alt. 6	Alt. 10
Type A	Regeneration	0	57	57	58
Type B	Regeneration	5	25	16	24
Type C	Regeneration	0	3	4	7
Type E	Overstory Removal	10	3	3	1
Type F	Seed Tree	10	2	1	2
Type G	Shelterwood	30	3	3	7
Type H	Shelterwood	50	1	1	1
Type I	Uneven-aged	70	6	15	1

Table 3.7-2. Acres of Special Wildlife Habitats Affected by Proposed Harvest and Road Construction by Alternative

Alternative	Beach Fringe and Estuary		Riparian Management Areas	
	Acres Units	Acres Roads	Acres Units	Acres Roads
Past Harvest	118	0	1,490	xxx
4	0	0	1,466	
6	0	0	1,191	
10	0	0	1,139	

Table 3.7-3. Changes in MIS Habitat Capability by Alternative

Species	Current Habitat Capability	Habitat Capability After Harvest (% change from 1994)		
	Alt. 1	Alt. 4	Alt. 6	Alt. 10
Black-tailed Deer ^{1/}	5,204	5,041 (-3 %)	5,058 (-3 %)	5,164 (-1 %)
Black Bear ^{2/}	261	254 (-3 %)	251 (-4 %)	259 (-1 %)
Wolf ^{1/}	17.9	17.3 (-3 %)	17.4 (-3 %)	17.8 (-1 %)
Marten ^{1/}	271	263 (-3 %)	264 (-3 %)	269 (-1 %)
River Otter	70	70 (0 %)	70 (0 %)	70 (0 %)
Bald Eagle	175	175 (0 %)	175 (0 %)	175 (0 %)
Vancouver Canada Goose	424	407 (-4 %)	411 (-3 %)	411 (-3 %)
Red-breasted Sapsucker ^{1/}	13,432	12,824 (-5 %)	12,917 (-4 %)	13,266 (-1 %)
Hairy Woodpecker ^{1/}	1,716	1,621 (-6 %)	1,639 (-4 %)	1,698 (-1 %)
Brown Creeper ^{1/}	2,691	2,580 (-4 %)	2,608 (-3 %)	2,673 (-1 %)

1/ Includes patch-size effectiveness reduction factor (see *Biodiversity* section).
2/ Includes disturbance reduction factor to account for disturbance to black bears associated with roads.

Table 3.7-4. Number of Units Affecting High Quality Habitat^{1/} by Alternative

Species	Alternative		
	4	6	10
Black-tailed Deer	16	16	2
Black Bear	102	96	37
Marten	79	72	24
River Otter	0	0	0
Bald Eagle	0	0	0
Canada Goose	1	2	0
Red-breasted Sapsucker	98	90	32
Hairy Woodpecker	42	39	7
Brown Creeper	14	10	1

1/ Habitat suitability index (HSI) value for each unit meets or exceeds 0.5.

Table 3.7-5. Sitka Black-tailed Deer Population Objectives and Habitat Capability by Alternative

WAA	Population Objective ^{1/}	Habitat Capability ^{1/}			
		1995 ^{2/}	Alt. 4	Alt. 6	Alt. 10
1318	1,796	2,721	2,689	2,685	2,707
1319	2,857	2,481	2,406	2,426	2,465
1323	1,497	1,751	1,726	1,719	1,744
1421	3,073	2,765	2,734	2,742	2,762

1/ Population objectives and habitat capabilities are for complete WAA's.

3.8 THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Alternatives 4, 6, and 10 may affect individual plants, but no Federal Candidate plant species or Region 10 sensitive plant species is expected to be significantly affected. Of the threatened, endangered, or sensitive wildlife species, the humpback whale, Stellar sea lion, peregrine falcon, osprey, Eskimo curlew, trumpeter swan, Aleutian Canada goose, Kittlitz's murrelet, and harlequin duck are not expected to be affected by these alternatives. Although the spotted frog may be affected, the effects are expected to be minor. Effects on the olive-sided flycatcher should be positive. Effects on the gray wolf, which is an MIS, are addressed under the *Wildlife* section. Reductions in habitat capability for Franklin's grouse are anticipated to be on the order of 1 to 5 percent under Alternatives 4, 6, and 10.

Alternatives 4, 6, and 10 would reduce the available nesting habitat for the marbled murrelet. Loss of old growth associated with these alternatives would range from 1,124 acres, or 1 percent of the existing old growth, for Alternative 10, to 3,606 and 4,106 acres, or approximately 5 percent for Alternatives 6 and 4, respectively. Old-growth fragmentation would also occur due to the harvest. A measure of the effect of fragmentation on murrelet habitat is provided by the patch-size effectiveness (PSE) for the Project Area calculated after implementation of one of the alternatives (Table 3.8-1). The PSE would be reduced slightly under Alternatives 4 and 6, and remain essentially unchanged under Alternative 10.

Alternatives 4, 6, and 10 do not propose harvesting in known goshawk nest areas. Further, none of these alternatives propose harvesting in the goshawk post-fledgling area (PFE) in the Logjam Creek drainage. Project effects on potential goshawk habitat are represented by the loss of old growth, especially volume classes 5 through 7, and the degree of fragmentation that would occur, particularly for large old-growth patches. Table 3.8-2 summarizes the loss of old growth and change in large patch sizes associated with Alternatives 4, 6, and 10. Harvest of volume classes 5 through 7 would be highest under Alternative 4 and lowest under Alternative 10. Correspondingly, the area of old growth remaining in large patches would be lowest under Alternative 4; the reduction would be 11 percent for patches greater than 1,000 acres and 7 percent for patches greater than 5,000 acres, relative to existing conditions. Alternative 10 would produce the smallest reduction in large patch areas; a 4 percent reduction for patches greater than 1,000 acres and a 1 percent reduction for patches greater than 5,000 acres.

Table 3.8-1. Acres of Old Growth Remaining and Average Patch-Size Effectiveness Indexes for the Marbled Murrelet by Alternative

		Alt. 1	Alt. 4	Alt. 6	Alt. 10
	1954	1995	1998	1998	1998
Acres of Old Growth	86,213	76,161	72,055	72,555	75,037
PSE	0.918	0.884	0.873	0.875	0.884

Table 3.8-2. Comparison of the Effects of the Alternatives on Goshawk Habitat (in Acres)

Alternative	Total Harvest	Harvest of VC4-7	Harvest of VC5-7	Area Remaining in OG Patches > 1,000 acres	Area Remaining in OG Patches > 5,000 acres
1	0	0	0	61,122	36,337
4	4,555	4,106	2,782	54,591	33,689
6	4,021	3,606	2,276	54,957	34,000
10	1,281	1,124	623	58,553	36,144

3.9 BIODIVERSITY

FOREST FRAGMENTATION

Alternatives 4, 6, and 10 would result in increased fragmentation of the Project Area. Figures 3.9-1 through 3.9-3 present detailed maps of forest and interior forest patch distribution for these alternatives, respectively. The total area of remaining forest patches greater than 10,000 acres would decline from 29,739 acres under existing conditions to 27,358 acres under Alternative 4 and 28,052 acres under Alternative 6 (Table 3.9-1). This area would not change under Alternative 10. Declines would occur in the 1,000 to 5,000 acre and 5,000 to 10,000 acre size classes for all three alternatives (Table 3.9-1). Interior forest patches would also be reduced in the larger size classes (Table 3.9-2). Overall, Alternative 10 results in the lowest fragmentation of large forest patches and Alternative results in the highest. This pattern holds true for both total and interior forest patches.

PATCH-SIZE EFFECTIVENESS

Table 3.9-3 displays the results of patch-size effectiveness for deer, marten, sapsuckers, hairy woodpeckers, and brown creepers. The patch-size effectiveness for the alternatives ranges from 88.7 to 89.8 percent for deer, 93.2 to 93.8 percent for marten, 94.3 to 94.8 percent for sapsuckers, 90.4 to 91.3 percent for hairy woodpeckers, and 98.9 to 99.1 percent for brown creepers. Alternative 4 ranks lowest and Alternative 10 ranks highest among these three alternatives for all species.

OLD-GROWTH RETENTION

Alternatives 6 and 10 would have little effect on the Project old-growth retention strategy, allowing 61 to 75 acres of harvest along the edges of identified HCA's and 0 to 260 acres of harvest within the corridors. Alternative 4 would compromise the ability of the medium HCA to function within the Project Area by allowing 1,101 acres of harvest within it.

Table 3.9-4 presents the acres of harvest and miles of new road construction within the HCA's and corridors of Project old-growth retention strategy by alternative.

Figure 3.9-1

Distribution of Forest and Interior Forest Patches Under Alternative 4

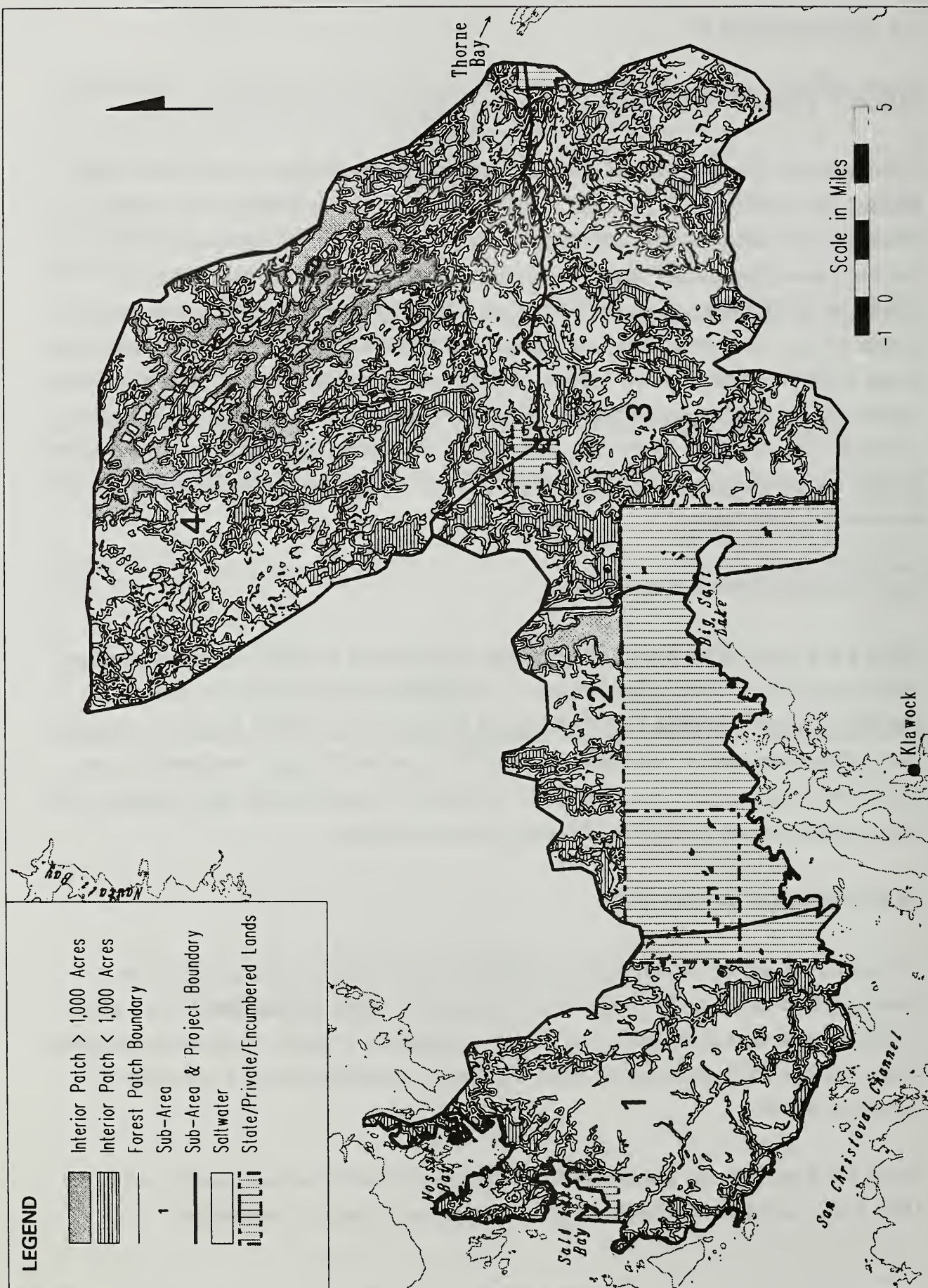
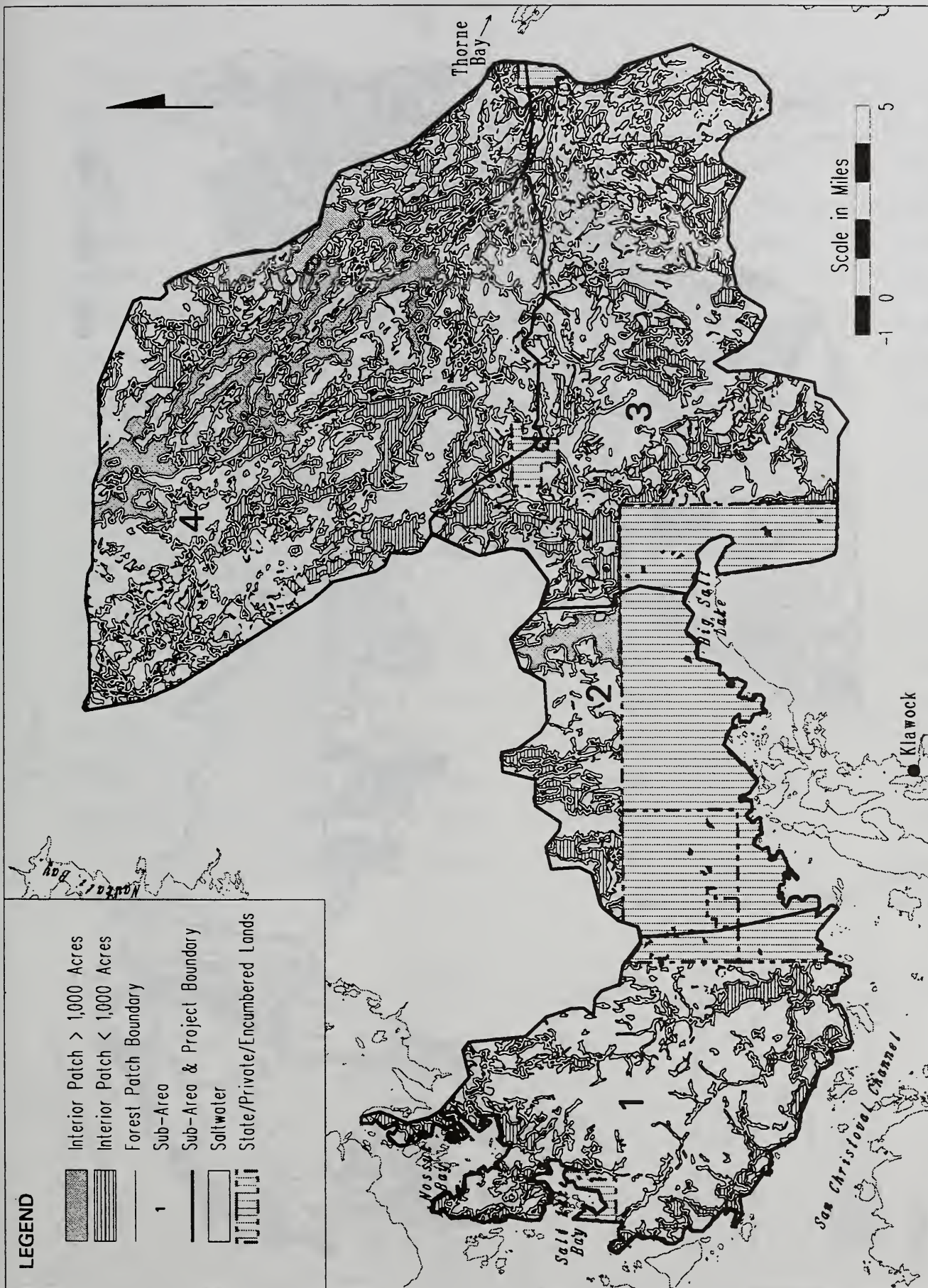


Figure 3.9-2
**Distribution of Forest and Interior Forest Patches Under
 Alternative 6**



/glacier3/controlk/aml/post8x11/patch98-all6
 June 09, 1995

Figure 3.9-3

Distribution of Forest and Interior Forest Patches Under Alternative 10

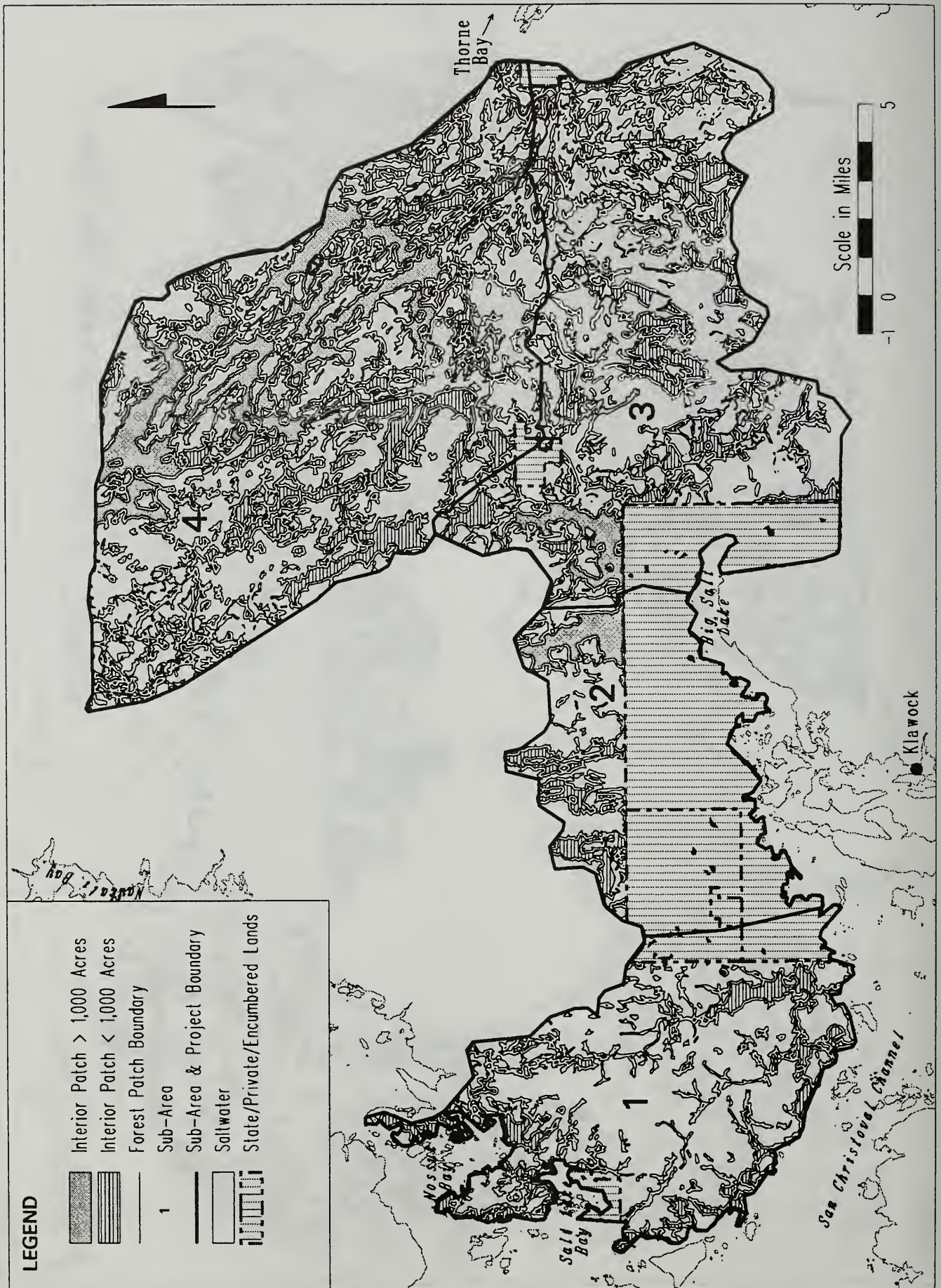


Table 3.9-1. Area in Forest Patches by Size Class for the Alternatives (in Acres)

Size Classes	1954	Alt. 1	Alt. 4	Alt. 6	Alt. 10
0-20	1,446	1,823	2,169	2,097	1,915
20-50	2,387	2,602	2,602	2,537	2,528
50-100	1,784	2,239	1,947	1,949	2,101
100-500	3,326	4,908	5,362	5,563	4,752
500-1,000	2,420	3,467	5,389	5,455	5,194
1,000-5,000	18,315	24,785	20,902	20,957	22,409
5,000-10,000	8,260	6,598	6,331	5,948	6,405
> 10,000	48,275	29,739	27,358	28,052	29,739
Total	86,213	76,161	72,060	72,558	75,043

Table 3.9-2. Area (Acres) in Interior Forest Patches by Size Class for the Alternatives

Size Classes	1954	Alt. 1	Alt. 4	Alt. 6	Alt. 10
0-20	1,422	1,833	2,000	1,833	1,797
20-50	1,154	1,457	1,714	1,627	1,405
50-100	2,249	2,174	2,245	1,978	2,136
100-500	6,770	6,662	6,130	6,782	6,466
500-1,000	2,181	3,099	2,162	2,950	2,579
1,000-5,000	22,069	10,210	7,152	7,167	10,065
5,000-10,000	0	0	0	0	0
> 10,000	0	0	0	0	0
Total	35,846	25,435	21,403	22,337	24,448

Table 3.9-3. Patch-size Effectiveness (PSE) Values for Five Management Indicator Species by Alternative

Species	1954	Alternatives			
		1 1995	4 1998	6 1998	10 1998
Sitka black-tailed deer	0.932	0.901	0.887	0.888	0.898
Marten	0.954	0.938	0.932	0.934	0.938
Red-breasted sapsucker	0.963	0.949	0.943	0.945	0.948
Hairy woodpecker	0.928	0.914	0.904	0.906	0.913
Brown creeper	0.994	0.991	0.989	0.990	0.991

Source: Forest Service, Ketchikan Area, database.

Table 3.9-4. Acres of Harvest and Miles of New Road Construction Within the HCA's and Corridors of Project Old-growth Retention Strategy by Alternative

	Alternative 4		Alternative 6		Alternative 10	
	Harvest Acres	Road Miles	Harvest Acres	Road Miles	Harvest Acres	Road Miles
Large Blocks	1,101	24	13	1	61	1
Small Blocks	0	3	62	4	0	0
Corridors	568	8	586	11	0	0

3.10 LANDS

No proposed harvest units in any of the alternatives would be located on the boundary between Forest Service and non-National Forest System land. There would be a maximum of six harvest units in these alternatives that would be located within 0.25 miles of non-National Forest System lands. The units are displayed in Table 3.10-1.

All units would have boundary lines established prior to implementation to ensure that harvest does not encroach on non-National Forest System land.

Table 3.10-1. Proposed Harvest Units Adjacent to or Within 0.25 Mile of Non-National Forest System Lands

Harvest Unit	Location	Adjacent Owner	Alternative That the Unit is In
593-431	Elevenmile Creek	Sealaska	6
594-419	Kogish Mountain Area	Sealaska	4, 6, 10
594-420	Kogish Mountain Area	Sealaska	4, 6, 10
595-402	Control Lake	State of Alaska	6
595-403	Control Lake	State of Alaska	6
595-412	Steelhead Creek	Sealaska	4, 6
595-418	Steelhead Creek	Sealaska	6
596-406	Control Lake	State of Alaska	6
596-407	Control Lake	State of Alaska	6

3.11 TRANSPORTATION AND FACILITIES

ROAD DEVELOPMENT

Table 3.11-1 displays the miles of new road and reconstructed road by road class and by alternative. Alternative 4, with 84 miles of new road, would extend existing roads further into Steelhead Creek, Logjam Creek, upper Hatchery Creek, Rio Roberts, Thorne, lower Control Creek, and upper Shinaku Creek.

Alternative 6, with 77 miles of new road, would extend existing roads further into Steelhead Creek, Logjam Creek, upper Hatchery Creek, Rio Roberts, Rio Beaver, Thorne, lower Control Creek, upper Shinaku Creek, and upper Elevenmile Creek.

Alternative 10, with 27 miles of new road, would extend existing roads further into Steelhead Creek, Rio Roberts, and upper Shinaku Creek.

The number of miles of arterial, collector, and local roads to be constructed under each of the alternatives is shown in Table 3.11-2. Most roads would be local and there are no arterials.

Table 3.11-3 displays the cost of bridges and major culverts, road construction, road reconstruction, and the road cost in dollars per MBF. Alternatives 4 and 6 have similar total road costs. Alternative 4 has the most inexpensive roads per MBF.

ACCESS MANAGEMENT

Motorized road access to several areas within the Control Lake Project Area would be eliminated because of the sensitivity of fisheries, wildlife, and subsistence resources. These road closures are shown in the large-scale, color Project Area map accompanying this EIS. The areas of primary concern are the Western Peninsula, the Honker Block, the goshawk PFA and related goshawk PFA late-successional corridor, and the Rio Roberts watershed and related Rio Roberts late-successional corridor.

Motorized road access into the Western Peninsula would be eliminated to protect wildlife resources and to minimize subsistence conflicts between roaded access and marine-based coastal access users. This access management strategy would be

Table 3.11-1. Miles of New and Reconstructed Road by Action Alternative

	Alternative 4		Alternative 6		Alternative 10	
	New	Recon.	New	Recon.	New	Recon.
574	13.0		4.6		0	
575	7.4	0.8	3.2		0	
576	11.8		1.6		0.7	
577	10.6		13.4		0	
578	0.5		0.5		0	
591	0		2.8		0	
592	0		0		0	
593	0		8.9		0	
594	6.7		5.3		2.5	
595	5.6	0.4	14.1	1.0	9.6	0.8
596	12.6	1.3	7.0	1.3	2.2	
597.1	1.0		0.1		1.2	
597.2	10.1	4.7	13.0	4.7	9.9	1.6
Outside Project Area	4.5		2.9		1.0	
Subtotal	83.9	7.5	77.3	6.9	27.1	2.4
Total New and Recon.	91.4		84.2		29.5	

Source: Forest Service GIS Database.

Table 3.11-2. Miles of road Construction/Reconstruction by Road Class and Alternative

Road Class	Alt. 4	Alt. 6	Alt. 10
Arterial	0	0	0
Collector	27.7	20.5	10.9
Local	63.7	63.7	18.6
Total	91.4	84.2	29.5

Table 3.11-3. Required Road Construction and Reconstruction Cost by Alternative

	Alt. 4	Alt. 6	Alt. 10
Road Construction (miles)	83.9	77.3	27.1
Road Reconstruction (miles)	7.5	6.9	2.4
Bridges Required	16	17	4
Large Culverts Required	36	34	8
Total Cost (\$MM)	\$15.87	\$15.43	\$3.83
Harvest Volume (MMBF)	129	106	38
Road Cost (\$MBF)	\$123	\$146	\$101

implemented in all alternatives with timber harvest in this area, specifically, Alternative 6.

Motorized road access into the Honker Block would be eliminated to protect wildlife resources. Elimination of motorized road access would occur at several sites within the Project Area including: (1) the Logjam Creek area and related road systems; (2) entry to the eastern Hatchery Creek area from the northeastern part of the Project Area; (3) entry into the northwestern part of the Project area (i.e., the roads to harvest units 574-443, 577-431 and 577-432); (4) new roads extending north and east from the Cutthroat Lakes area; (5) roads leading to Harvest Units 596-403, 596-402, and 596-403 in the southwestern part of the Honker Block off FR 30; and (6) the roads extending off FR 30 and leading to harvest unit 595-424 and the harvest units in the vicinity of 597-406. This access management strategy would be implemented in Alternatives 4, 6, and 10.

Motorized road access to the Rio Roberts watershed and related Rio Roberts late-successional corridor would be eliminated to protect wildlife resources and to minimize potential road use-related sediment influxes to the stream systems in the watershed. This access management strategy would be implemented in Alternatives 4 and 6.

LTF'S AND LOGGING CAMPS

Table 3.11-4 shows the estimated volume of timber that would be transported through the four LTF's that serve the Project Area. Coffman Cove and Naukati would not be utilized in Alternative 10.

Table 3.11-4. Estimated Volume of Timber by LTF (MBF)

Alternative	Thorne Bay	Coffman Cove	Winter Harbor	Naukati
4	81.6	15.6	8.7	18.1
6	64.0	8.7	11.4	17.4
10	32.9	0	16.2	0

New logging camps would not be needed to harvest timber under these alternatives. The community of Thorne Bay would serve the majority of the Project Area. Logging personnel would also commute from Coffman Cove and other communities on Prince of Wales Island.

3.12 ECONOMIC EFFICIENCY ANALYSIS

ECONOMIC EFFICIENCY ANALYSIS

Table 3.12-1 displays the results of an Economic Efficiency Assessment for Alternatives 4, 6, and 10. A detailed discussion of the methodology used is presented in Chapter 4.

As indicated in Table 3.12-1, all three alternatives would produce negative stumpage values using mid-market prices. However, using current timber prices, all of the stumpage values would be positive. Highest stumpage values would be produced by Alternative 4.

PUBLIC INVESTMENT ANALYSIS

Public investment analysis of the timber harvest alternatives incorporates the concept of the time value of money or Present Net Value (PNV). Present-day costs and management expenses are subtracted from net stumpage revenues (assuming current timber prices). A detailed discussion of the methodology used is presented in Chapter 4. Table 3.12-2 presents the results of the PNV analysis for the alternatives.

Socioeconomic Analysis

Multipliers generated by the Forest Service's economic model, IMPLAN, were used to provide estimates of levels of employment and income which would be supported by each of the proposed timber harvest alternatives within the Control Lake Project Area. The economic effect of any alternative is composed of primary or direct effects, and secondary or indirect and induced effects. Direct effects are measured primarily as increases in employment and income within the wood product industry (including harvesting, construction, logging, transportation, processing, and sawmill operations) resulting from any changes in production levels. This methodology is based on the assumption that any increase in production is in response to an increase in market demand. Indirect and induced effects, here on to be referred to as indirect effects, are an economic by-product of increased expenditures (increased demand) for goods and services on the part of industries directly involved in timber harvesting, as well as the additional wage earners employed in timber harvesting and production. A detailed discussion of the methodology used is presented in Chapter 4 of the EIS.

Table 3.12-1. Economic Efficiency Assessment

	Alt. 4	Alt. 6	Alt. 10
Total Volume (MBF)	129,279	106,217	37,733
Pond Log Value Per MBF (Mid-Market)	\$300.66	\$298.55	\$300.80
Pond Log Value Per MBF (Current Values)	\$521.00	\$521.00	\$521.00
Logging Costs Per MBF	\$136.65	\$129.18	\$172.03
Transportation Costs Per MBF	\$67.73	\$67.74	\$69.92
Road Costs Per MBF	\$122.78	\$146.04	\$101.49
Direct Costs Per MBF	\$327.16	\$342.96	\$343.44
60% Profit Margin Per MBF	\$47.45	\$47.72	\$48.03
Net Stumpage Value Per MBF (Mid-Market)	(\$73.94)	(\$92.13)	(\$90.67)
Net Stumpage Value Per MBF (Current Values)	\$146.39	\$130.32	\$129.53

1/ Pond log values: Mid-market is based on 10-year historic average values and actual species composition in each alternative; current value is based on 1st quarter 1995 values and average Forest-wide species composition.

2/ Direct costs = Total logging costs and total transportation.

3/ Net stumpage value = Pond log value - total direct costs - 60% profit margin.

Table 3.12-2. Public Investment Summary

	Alt. 4	Alt. 6	Alt. 10
Forest Service Revenues:			
Volume (MBF)	129,279	106,217	37,733
Net Stumpage Value ^{1/} Per MBF (Current Values)	\$146.39	\$130.32	\$129.53
Total Pond Log Value	\$18,925,153	\$13,842,199	\$4,887,555
Forest Service Fixed Costs:			
Acres	4,555	4,021	1,281
Forest Service Pre-Harvest Costs (per acre)	\$1,554.20	\$1,554.20	\$1,554.20
Forest Service Pre-Harvest Costs	\$7,079,381	\$6,249,438	\$1,990,930
Present Net Value (PNV):			
PNV	\$11,845,772	\$7,592,760	\$2,896,625

Tables 3.12-3 and 3.12-4 present direct and indirect employment and income effects associated with each of the three alternatives. Employment and income effects associated with each alternative directly relate to total harvest expenditures associated with each alternative. Harvest expenditures are in turn a function of harvest volume. Therefore, of the three alternatives, alternative 4 would create the most employment and generate the most income since it proposes a harvest which is greater than that of Alternatives 6, and 10.

Fiscal Analysis

Although it is not possible to accurately determine timber sale revenues to the Federal government, pond log values net of specified road and logging costs can be used as basis for an approximation. Moreover, it is estimated that 25 percent of gross National Forest receipts go to the State of Alaska and are returned to local areas with distribution based on a percent of the National Forest in an area.

As indicated in Tables 3.12-4 and 3.12-5, Alternative 4 is expected to produce the largest receipts to the State of Alaska and the Ketchikan Area while Alternatives 6 and 10 would yield lower receipts.

In spite of the results of the analysis, overall, fiscal and socioeconomic impacts are not meant to serve as indicators of alternative preference. Rather, they are indicators of peripheral economic implications associated with each alternative.

Table 3.12-3. Total Employment and Income Effects

	Alternative 4		Alternative 6		Alternative 10	
	Employment ^{1/}	Income ^{2/}	Employment ^{1/}	Income ^{2/}	Employment ^{1/}	Income ^{2/}
Timber Harvesting						
Logging	301	\$10.33	234	\$8.02	110	\$3.79
Construction	130	\$5.03	107	\$4.13	26	\$1.02
Marine Transport	7	\$0.20	5	\$0.16	2	\$0.06
Subtotal	438	\$15.55	346	\$12.31	139	\$4.87
Timber processing						
Sawmills	203	\$7.38	167	\$6.07	59	\$2.13
Pulpmills	314	\$13.54	258	\$11.13	90	\$3.90
Subtotals	517	\$20.92	425	\$17.20	149	\$6.03
Total	955	\$36.47	771	\$29.51	288	\$10.90

1/ Employment = Direct Employment (person-years)

2/ Income = Direct Income (\$ million)

Table 3.12-4. Employment Effects and Estimated Return to the State and Ketchikan from Federal Income Taxes Derived from Project

	Alternative 4	Alternative 6	Alternative 10
Employment Effects			
Direct Jobs	955	771	288
Indirect Jobs	423	345	120
Total Jobs	1377	1116	408
Total Personal Income	\$48,193,716	\$39,081,161	\$14,317,076
Federal Income Tax	\$9,156,806	\$7,425,421	\$2,720,244
25% Transfer to State from Federal Income Tax (estimated)	\$2,289,201	\$1,856,355	\$680,061
Payment to Ketchikan (4.5% of total State receipts - estimated)	\$103,014	\$83,536	\$30,603

Table 3.12-5. Estimated Payments to the State of Alaska

	Alternative 4	Alternative 6	Alternative 10
Total Volume (MBF)	129,279	106,217	37,733
Net Stumpage Value ^{1/} per MBF (current value)	\$146.39	\$130.32	\$129.53
Road Construction Costs (per MBF) ^{2/}	\$128.19	\$152.41	\$107.38
Net Stumpage Value + Road Construction Costs (per MBF)	\$274.58	\$282.73	\$236.91
Less \$0.50/MBF to Treasury ^{3/}	\$274.08	\$282.23	\$236.41
Multiplied by MBF ^{4/}	\$35,432,788	\$29,977,624	\$8,920,459
25% to State	\$8,858,197	7,494,406	\$2,230,115

Source: Greenstein 1995.

1/ current values are based on 1st quarter 1995 values and average Forest-wide species composition.

2/ Includes road construction, road reconstruction, and LT construction costs.

3/ \$0.50/MFB is the minimum payment to the U.S. Treasury

4/ National Forest Receipts Act payments (25% of net stumpage value plus the value of capital improvements such as purchaser credit for roads, LTF's, and timber stand improvements) to the State of Alaska.

3.13 SUBSISTENCE

IMPACTS ON SUBSISTENCE USE OF DEER

Estimated 1995 habitat capability is below the level that can sustain projected 1995 harvest levels on a continuing basis in Project Area WAA's (Table 3.13-1). After implementation of Alternative 4, 6, or 10, estimated habitat capability would decline further. The largest decrease would be under Alternative 4 and the smallest decrease would be under Alternative 10. The population needed to support the total harvest would exceed total habitat capability by 11 to 12 percent.

Table 3.13-1. Project Area Deer Populations Needed to Support Predicted 1995 Demand from Rural and Non-rural Communities Compared to Habitat Capability in 1998 by Alternative

WAA	Population Needed to Support ^{1/}		1995 Habitat Capability ^{2/}	1998 Habitat Capability ^{2/}		
	Rural Harvest	Total Harvest		Alt. 4	Alt. 6	Alt. 10
1318	3,230	3,910	2,721	2,689	2,685	2,707
1319	2,450	3,300	2,481	2,406	2,426	2,465
1323	960	1,390	1,751	1,726	1,719	1,744
1421	1,050	2,310	2,765	2,734	2,742	2,762
Total	7,630	10,910	9,718	9,555	9,572	9,678

SOURCE: Thornton 1992. Data derived from ADF&G Deer harvest Survey Summary Statistics 1987-1991 and Forest Service, Ketchikan Area, database.

1/ Estimates are based on the entire WAA, including portions outside the Project Area. They are based on predicted 1995 harvest levels using observed 1988-91 harvest levels, which are increased 1.8% per year.

2/ Habitat capabilities are for the entire WAA, including portions outside the Project Area. Habitat capabilities are reduced using Project Area Patch Size Effectiveness Index value.

The effect of Alternatives 4, 6, or 10 on access to traditional subsistence use areas along the Elevenmile shoreline would be minor. Only Alternative 6 allows some harvest in

the Western Peninsula, but this harvest is about 3 miles from shoreline areas and roads would be closed after harvest. New and rebuilt roads would provide access to areas that were not previously used for subsistence harvest of deer. Road access under the various alternatives is described in *Transportation and Facilities*. New access would be greatest under Alternatives 4 and 6 and least under Alternative 10.

Competition for subsistence resources between rural and non-rural users is an issue for residents of Prince of Wales Island. Chapter 3 of the Draft EIS and Table 3.13-1 indicate that there is competition under existing conditions at least in WAA's 1318 and 1319. This same observation would hold true under Alternatives 4, 6, or 10. Within the foreseeable future, competition may also become important in WAA's 1323 and 1421 (see Table 4-78 in the Draft EIS).

Tables 3.13-2 and 3.13-3 display the number of acres used by 5 percent or more and 15 percent or more, respectively, of rural community households that would be harvested under Alternatives 4, 6, and 10. Results show that these alternatives would harvest from 222 to 490 acres of the Project Area used by 15 percent or more of rural community households.

Each of the alternatives would create a significant possibility of a significant restriction of subsistence use of Sitka black-tailed deer by the residents of most local communities through the reasonably foreseeable future. Coffman Cove, Craig, Klawock, Thorne Bay, and Whale Pass are the communities most affected. Restriction of non-rural harvests may be necessary at some point in the near future (Table 3.13-4).

IMPACTS ON SUBSISTENCE USE OF OTHER RESOURCES

Black bear habitat capability in 1995 is estimated at 508 for Project Area WAA's versus the 490 needed to support harvests (Table 3.13-5). Alternatives 4, 6, and 10 would reduce habitat capability by 3 to 9 bears. Habitat capability is expected to decline below the needed population within the foreseeable future.

In 1995, marten habitat capability was 490 for Project Area WAA's, compared to a needed population of 400 (Table 3.13-6). Alternatives 4, 6, and 10 would reduce habitat capability by 2 to 8 marten. Habitat capability is expected to decline to approximately equal the needed population within the foreseeable future.

Table 3.13-2. Acreage Used by More than 5 Percent of Rural Community Households for Deer Hunting, and Acres Proposed for Timber Harvest by Alternative and Community

Rural Community	Acres Used by $\geq 5\%$ of Community Households	Acreage Proposed for Harvest			
		Alt. 1	Alt. 4	Alt. 6	Alt. 10
Coffman Cove	7,206	0	102	109	0
Craig	18,332	0	223	95	179
Hollis	134	0	0	0	0
Hydaburg	6,241	0	206	110	94
Klawock	48,294	0	203	470	102
Thorne Bay	21,001	0	605	439	154

SOURCE: Kruse and Muth 1990. Derived from TRUCS database using GIS.

Table 3.13-3. Acreage Used by More than 15 Percent of Rural Community Households for Deer Hunting, and Acres Proposed for Timber Harvest by Alternative and Community

Rural Community	Acres Used by $\geq 15\%$ of Community Households	Acreage Proposed for Harvest			
		Alt. 1	Alt. 4	Alt. 6	Alt. 10
Coffman Cove	0	0	0	0	0
Craig	2,543	0	6	6	6
Hollis	0	0	0	0	0
Hydaburg	0	0	0	0	0
Klawock	15,611	0	193	76	77
Thorne Bay	7,599	0	291	163	139

SOURCE: Kruse and Muth 1990. Derived from TRUCS database using GIS.

Table 3.13-4. Significant Possibility of a Significant Restriction of Subsistence Use of Sitka Black-Tailed Deer for the Reasonably Foreseeable Future for each Alternative and Community

Community	Significant Possibility of Restriction			
	Alt. 1	Alt. 4	Alt. 6	Alt. 10
Abundance or Distribution				
Coffman Cove	May	Yes	Yes	May
Craig	May	Yes	Yes	May
Hollis	No	No	No	No
Hydaburg	No	May	May	May
Klawock	May	Yes	Yes	May
Naukati	No	May	May	May
Thorne Bay	May	Yes	Yes	May
Whale Pass	May	Yes	May	May
Access: All Communities	No	No	No	No
Competition: All Communities	Yes	Yes	Yes	Yes

Note: "No" indicates an insignificant possibility of a substantial effect. "Yes" indicates a significant possibility of a substantial effect in the future. "May" indicates there may be a significant possibility of a substantial effect in the future.

Table 3.13-5. Project Area Black Bear Populations Needed to Support Predicted 1995 Demand from Rural and Non-rural Communities Compared to Habitat Capability in 1998 by Alternative

WAA	Population Needed to Support ^{1/}		1995 Habitat Capability ^{2/}	1998 Habitat Capability ^{2/}		
	Rural Harvest	Total Harvest		Alt. 4	Alt. 6	Alt. 10
1318	110	350	164	162	162	162
1319	60	100	142	140	140	141
1323	0	10	61	61	58	61
1421	10	30	141	138	139	141
Total	180	490	508	501	499	505

SOURCE: Paul 1992. Data derived from ADF&G Black Bear Harvest Survey Summary Statistics 1988-1992 and Forest Service, Ketchikan Area, database.

1/ Estimates are based on the entire WAA, including portions outside the Project Area. They are based on predicted 1995 harvest levels using observed 1987-1991 harvest levels, which are increased 1.8% per year.

2/ Habitat capabilities are for the entire WAA, including portions outside the Project Area. Habitat capabilities are reduced using estimated disturbance factors to account for disturbance associated with roads.

Table 3.13-6. Project Area Marten Populations Needed to Support Predicted 1995 Demand from Rural and Non-rural Communities Compared to Habitat Capability in 1998 by Alternative (Rural Harvest Represents about 86 Percent of Total Harvest)

WAA	Population Needed to Support ^{1/} Total Harvest	1995 Habitat Capability ^{2/}	1998 Habitat Capability ^{2/}		
			Alt. 4	Alt. 6	Alt. 10
1318	180	108	107	106	107
1319	162	153	148	150	152
1323	0	63	63	62	63
1421	58	166	164	165	166
Total	400	490	482	483	488

SOURCE: Paul 1992. Data derived from ADF&G Marten Harvest Survey Summary Statistics 1988-1992, and Forest Service, Ketchikan Area, database.

1/ Estimates are based on the entire WAA, including portions outside the Project Area. They are based on predicted 1995 harvest levels using 1988-91 harvest levels, which are increased 1.8% per year.

2/ Habitat capabilities are for the entire WAA, including portions outside the Project Area. Habitat capabilities are reduced using Project Area Patch Size Effectiveness Index value. Numbers in parentheses represent habitat capability after being reduced by the Road Density Index and underestimate habitat capability in some WAA's.

Project Area WAA's provided an estimated habitat capability about 1.5 times greater than that required to support harvests in 1995 (Table 3.13-7). Harvesting under Alternatives 4, 6, and 10 is not expected to reduce river otter habitat capability through the foreseeable future.

The effects of Alternatives 4, 6, and 10 on other subsistence resources of the Project Area are not expected to be significant.

The actions proposed under Alternatives 4, 6, and 10 would not produce a significant possibility of a restriction on subsistence use of salmon and other fin fish. However, a significant possibility of a restriction is predicted for marten and black bear under all three alternatives within the foreseeable future (Table 3.13-8).

Table 3.13-7. Project Area River Otter Populations Needed to Support Predicted 1995 Demand from Rural and Non-rural Communities Compared to Habitat Capability in 1998 by Alternative

WAA	Population Needed to Support ^{1/} Total Harvest	1995 Habitat Capability ^{2/}	1998 Habitat Capability ^{2/}		
			Alt. 4	Alt. 6	Alt. 10
1318	40	33	33	33	33
1319	25	38	38	38	38
1323	0	46	46	46	46
1421	20	47	47	47	47
Total	105	164	164	164	164

SOURCE: Paul 1992. Data derived from ADF&G River Otter Harvest Survey Summary Statistics 1988-1992.

1/ Estimates are based on the entire WAA, including portions outside the Project Area. They are based on predicted 1995 harvest levels using observed 1987-91 harvest levels, which are increased 1.8% per year.

2/ Habitat capabilities are for the entire WAA, including portions outside the Project Area.

Table 3.13-8. Significant Possibility of a Significant Restriction of Subsistence Use of Other Resources—All Alternatives

	Marten	River Otter	Black Bear	Fish/Shellfish	Others
Abundance or Disturbance	May	No	Yes	No	No
Access	No	No	No	No	No
Competition	May	No	Yes	No	No

Note: "No" indicates an insignificant possibility of a substantial effect. "Yes" indicates a significant possibility of a substantial effect. "May" indicates there may be a significant possibility of a substantial effect.

3.14 CULTURAL RESOURCES

Under Alternatives 4 and 10 there would be no timber harvest on the Western Peninsula and no risk of indirect impacts to cultural resources. Under Alternative 6 timber harvest would extend into the upper Elevenmile drainage on the Western Peninsula; however, there would be no harvest at or close to known cultural resource sites and thus, no risk of indirect impacts.

3.15 VISUAL

Two units proposed within Visual Priority Travel Route and Use Area viewsheds are common to Alternatives 4, 6, and 10. Unit 594-420 would be seen in the background distance zone by users of the West Coast Waterway, while unit 595-406 would be visible in the middleground to those using the waters around Craig and Klawock.

As shown in Table 3.15-1, Alternative 6 would harvest more units (19) within Visual Priority Travel Route and Use Area viewsheds than would Alternatives 4 or 10 (9 units and 3 units, respectively). "Patch-cutting" would allow six of these units, including all four units proposed within the Thorne River/Honker Divide Canoe Route viewshed, to meet the Retention VQO. Thirteen units would be apparent to casual Forest visitors in the West Coast Waterway, Waters around Craig and Klawock, Control Lake Cabin Site, Eagle's Nest Campground, and Cutthroat Lakes viewsheds.

Alternative 4 would harvest nine units within Visual Priority Travel Route and Use Area viewsheds. "Patch-cutting" would allow the four units proposed within the Thorne River/Honker Divide Canoe Route viewshed to meet the Retention VQO. Five units would be apparent to casual Forest visitors in the West Coast Waterway, Waters around Craig and Klawock, and Cutthroat Lakes viewsheds.

Alternative 10 would harvest three units within Visual Priority Travel Route and Use Area viewsheds, each being apparent to casual Forest visitors. These units would be apparent in the West Coast Waterway, Waters around Craig and Klawock, and Control Lake Cabin Site viewsheds.

Table 3.15-1. Summary of Visual Effects by Viewshed

Viewshed	Number of Units Proposed Within Viewshed Boundaries			Number of Units Visible to Casual Forest Visitor		
	Alt. 4	Alt. 6	Alt. 10	Alt. 4	Alt. 6	Alt. 10
West Coast Waterway	2	5	1	2	5	1
Waters Around Craig and Klawock	1	5	1	1	5	1
Control Lake Cabin Site	0	2	1	0	1	1
Eagle's Nest Campground	0	2	0	0	1	0
Cutthroat Lakes	2	1	0	2	1	0
Thorne River/ Honker Divide Canoe Route	4	4	0	0	0	0
Total	9	19	3	5	13	3

3.16 RECREATION, ROADLESS AREAS, WILD AND SCENIC RIVERS, AND WILDERNESS AREAS

IMPACTS ON ROS SETTINGS

Table 3.16-1 shows the changes in ROS setting by alternative. Alternatives 4 and 6 would have very similar impacts in terms of changes in ROS settings and opportunities for roaded and unroaded recreation. The two alternatives would convert approximately 33,800 acres of the existing 109,500 acres of roadless ROS settings to roaded (RM). Both would also eliminate the ROS setting of P within the Project Area. Opportunities for roaded recreation would increase with these two alternatives, and opportunities for unroaded recreation would decrease. Alternative 6 would have fewer harvest units in the general proximity of the Thorne River/Hatchery Creek waterway than Alternative 4. As a result, users of the route would hear and be more aware of logging activities associated with Alternative 4 than with Alternative 6.

Table 3.16-1. Changes in ROS Settings by Alternatives

ROS Setting	Existing	Alt. 4	Alt. 6	Alt. 10
P	11,720	0	0	11,720
SPNM	97,754	75,640	75,682	93,143
SPM	6,267	6,829	6,829	5,131
RN	6,964	6,923	5,157	5,186
RM	49,205	82,518	84,242	56,730
Total	171,910	171,910	171,910	171,910

Source: Forest Service, Ketchikan Area, database.

Alternative 10 would convert approximately 16,600 acres of unroaded ROS settings to roaded. With Alternative 10, a 12,000-acre P setting surrounding Lake Galea would remain as would most of the SPNM in the vicinity of the Thorne River/Hatchery Creek waterway. Alternative 10 would convert the least amount of unroaded ROS settings to roaded of all the alternatives.

IMPACTS ON RECREATION PLACES

The following discusses the effects of the alternatives on freshwater-, land-, and marine-based recreation places. Table 3.16-2 contains the changes in ROS settings for these recreation places with each alternative.

Freshwater-based Recreation Places

Alternative 4 would designate harvest units in the Honker Divide and would place harvest units within or on the edge of the RP's included in the waterway. Alternatives 6 and 10 place no units near the Honker Divide RP's. Alternative 4 would change the recreational experience along the Honker Divide waterway. Road building and harvest activities in the vicinity of the waterway would be heard and road access during harvest activities would temporarily change the remote qualities in parts of the waterway.

Land-based Recreation Places

Alternative 4 would create the greatest changes of the three alternatives to existing land-based recreation settings. Introducing harvest units and roads into the RP's would change the visual quality and remote character currently found in the RP's.

Marine-based Recreation Places

No changes in recreational experience would be anticipated along the Western Peninsula because none of the three alternatives would place harvest units within 0.25 mile of the coastline.

IMPACTS TO RECREATION SITES

Impacts to existing and potential recreation sites by ROS setting are shown in Tables 3.16-3 and 3.16-4, respectively. Alternatives 4, 6, and 10 would have minimal effects on existing and potential recreation sites. Opportunities for recreating at existing recreation sites located in remote undisturbed areas would decrease slightly with the three alternatives.

Table 3.16-2. Changes in ROS Settings Found in Freshwater-Based, Land-Based, and Marine-Based Recreation Places by Alternative

	P	SPNM	SPM	RN	RM
Freshwater-Based - Thorne River/Hatchery Creek Waterway					
Existing	5,484	12,456	-	1,587	97
Alternative 4	-	16,507	-	1,542	1,576
Alternative 6	-	17,660	-	1,542	415
Alternative 10	5,484	-12,389	-	1,528	222
Freshwater-based - Out of Thorne River/Hatchery Creek Waterway					
Existing	-	3,595	-	2,197	2,750
Alternative 4	-	3,869	-	2,128	2,544
Alternative 6	-	3,396	-	1,648	3,497
Alternative 10	-	3,316	-	2,209	2,916
Land-Based					
Existing	-	6,465	-	-	3,069
Alternative 4	-	5,939	-	-	3,596
Alternative 6	-	5,761	-	6	3,766
Alternative 10	7	6,472	-	43	3,003
Marine-Based					
Existing	-	-	4,479	-	1,162
Alternative 4	-	133	4,479	-	1,162
Alternative 6	-	133	4,346	-	1,162
Alternative 10	-	-	4,346	-	1,162

1/ Some existing ROS settings of P would be converted to SPNM, thus some alternatives would have more area of SPNM than the existing condition.

Table 3.16-3. ROS Settings of Existing Recreation Sites by Alternative.

ROS Setting	Existing	Alt. 4	Alt. 6	Alt. 10
P	1	1	0	1
SPNM	1	-	2	-
SPM	9	9	9	9
RN	5	6	4	6
RM	-	-	1	-
Total	16	16	16	16

Table 3.16-4. ROS Settings of Potential Recreation Sites by Alternatives.

ROS Setting	Existing	Alt. 4	Alt. 6	Alt. 10
P	-	-	-	-
SPNM	8	8	8	8
SPM	3	3	3	3
RN	4	3	3	4
RM	-	1	1	-
Total	15	15	15	15

COMMERCIAL OUTFITTERS AND GUIDES

Alternatives 4 and 6 would change the "scenery" and "wilderness" characteristics of various parts of the Project Area to varying degrees. For example, harvest activities associated with Alternative 4 would change the scenery and wilderness characteristics along the Thorne River/Hatchery Creek Waterway. Although no harvest would be seen from the waterway, noise would be heard along the waterway during harvesting. Alternative 6 would moderately change the scenery and wilderness characteristics of the Western Peninsula. Alternative 10 does not affect either the Western Peninsula or the Thorne River/Hatchery Creek Waterway.

EFFECTS OF TIMBER INDUSTRY FACILITIES AND EMPLOYEES

Employee-generated impacts from the Control Lake project would not be as great as with other sales. There would be no need for new logging camps because logging personnel would live in existing communities. The primary impact from logging personnel would be from the roaded access they have to areas previously inaccessible by road. Current recreational users of those areas, may avoid them due to the presence of new users. Alternative 10 has the least and Alternative 4 has the most employee-generated effect.

ROAD MANAGEMENT

Road Management under Alternatives 4, 6, and 10 would be the same as the action alternatives in the EIS.

ROADLESS AREAS

All the alternatives would reduce the amount of land in the Project Area classified as roadless (Table 3.16-5). Alternative 4 would have the greatest effect in this regard while Alternative 10 would have the least.

EFFECTS ON WILD AND SCENIC RIVERS

Alternative 4 would have introduce harvest units near the upper Thorne River/Hatchery Creek Waterway and could change the eligibility of the upper 3-mile segment for meeting the criteria for wild river designation. The upper 8-mile segment would meet

Table 3.16-5. Roadless Areas Under Each Alternative

Roadless Area	Existing	Alt. 4	Alt. 6	Alt. 10
Kogish (509)	37,164	29,663	20,743	32,249
Karta (510)	16,883	5,890	9,324	10,602
Thorne River (511)	53,890	36,684	43,289	51,568
Total	<u>107,937</u>	<u>72,237</u>	<u>73,356</u>	<u>94,419</u>
% Change in Roadless Area	0	(33%)	(32%)	(87%)

the criteria for scenic river designation, as would the middle 15-mile segment. Alternatives 6 and 10 would not effect eligibility criteria for any segments of the waterway.

WILDERNESS

None of the alternatives would have a significant impact on Wilderness Area. Alternatives 4, 6, and 10 all place harvest units adjacent to the Karta Wilderness. The only effect the harvest units would have on the Karta Wilderness would be changes in the ROS settings of some lands along the border of the wilderness and the Project Area.

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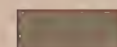

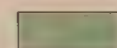

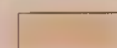

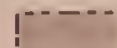
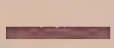
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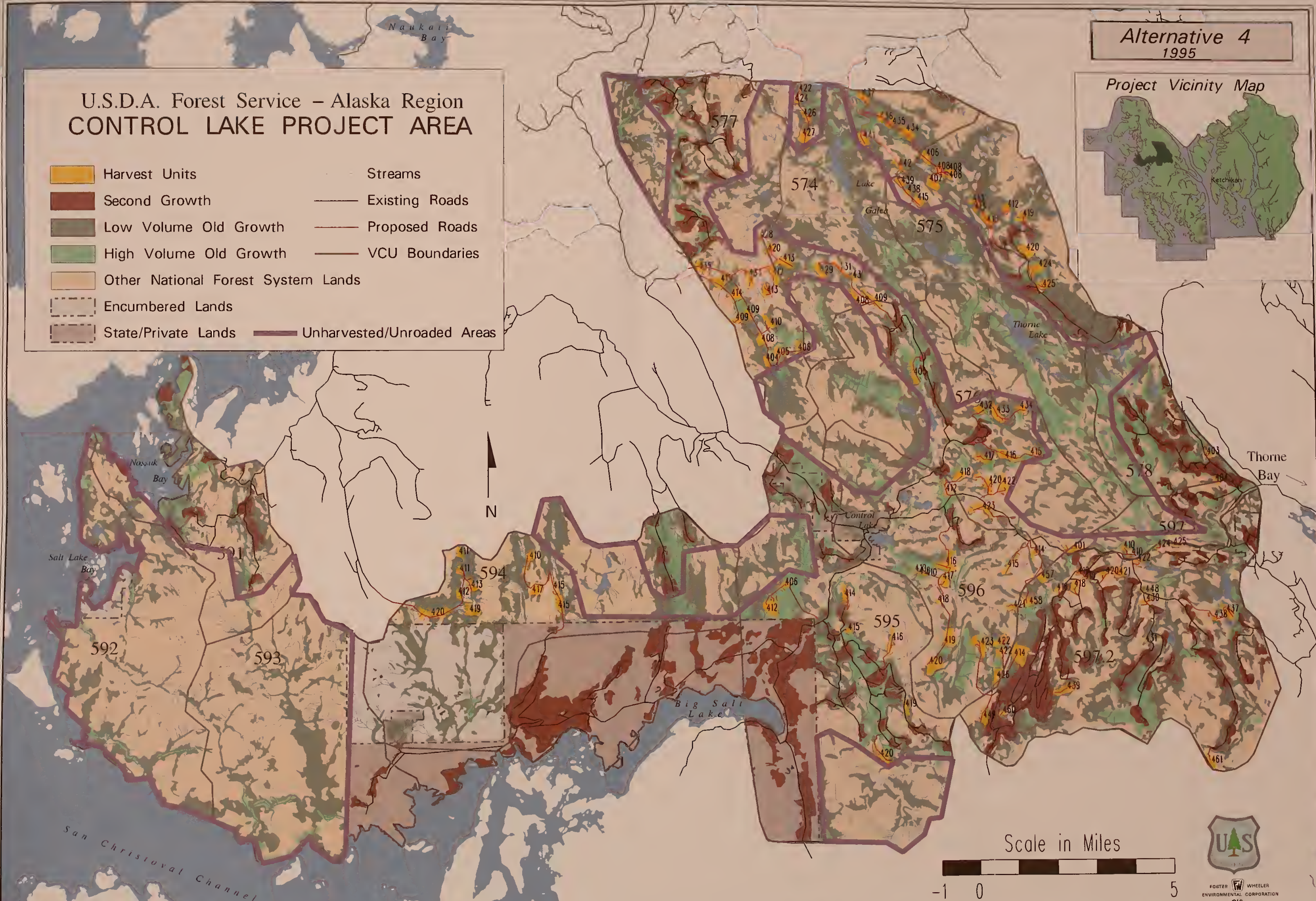
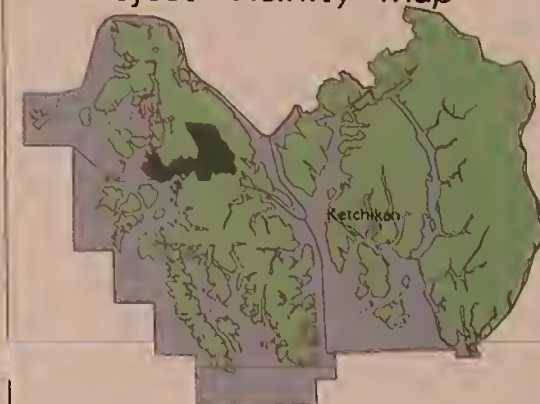
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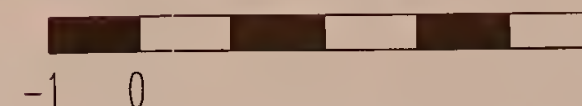
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|  Harvest Units |  Streams |
|  Second Growth |  Existing Roads |
|  Low Volume Old Growth |  Proposed Roads |
|  High Volume Old Growth |  VCU Boundaries |
|  Other National Forest System Lands | |
|  Encumbered Lands | |
|  State/Private Lands |  Unharvested/Unroaded Areas |

Alternative 4
1995

Project Vicinity Map



Scale in Miles



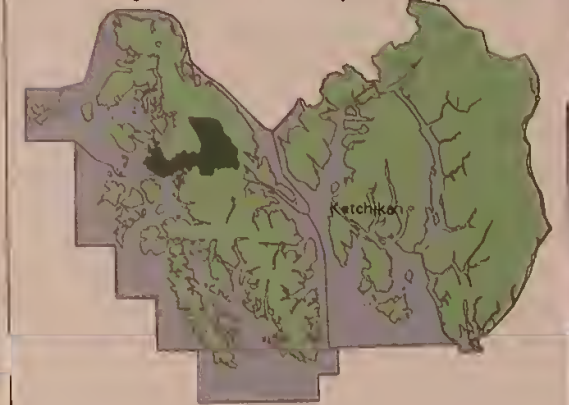
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Klawock

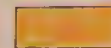



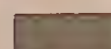



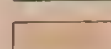
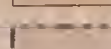


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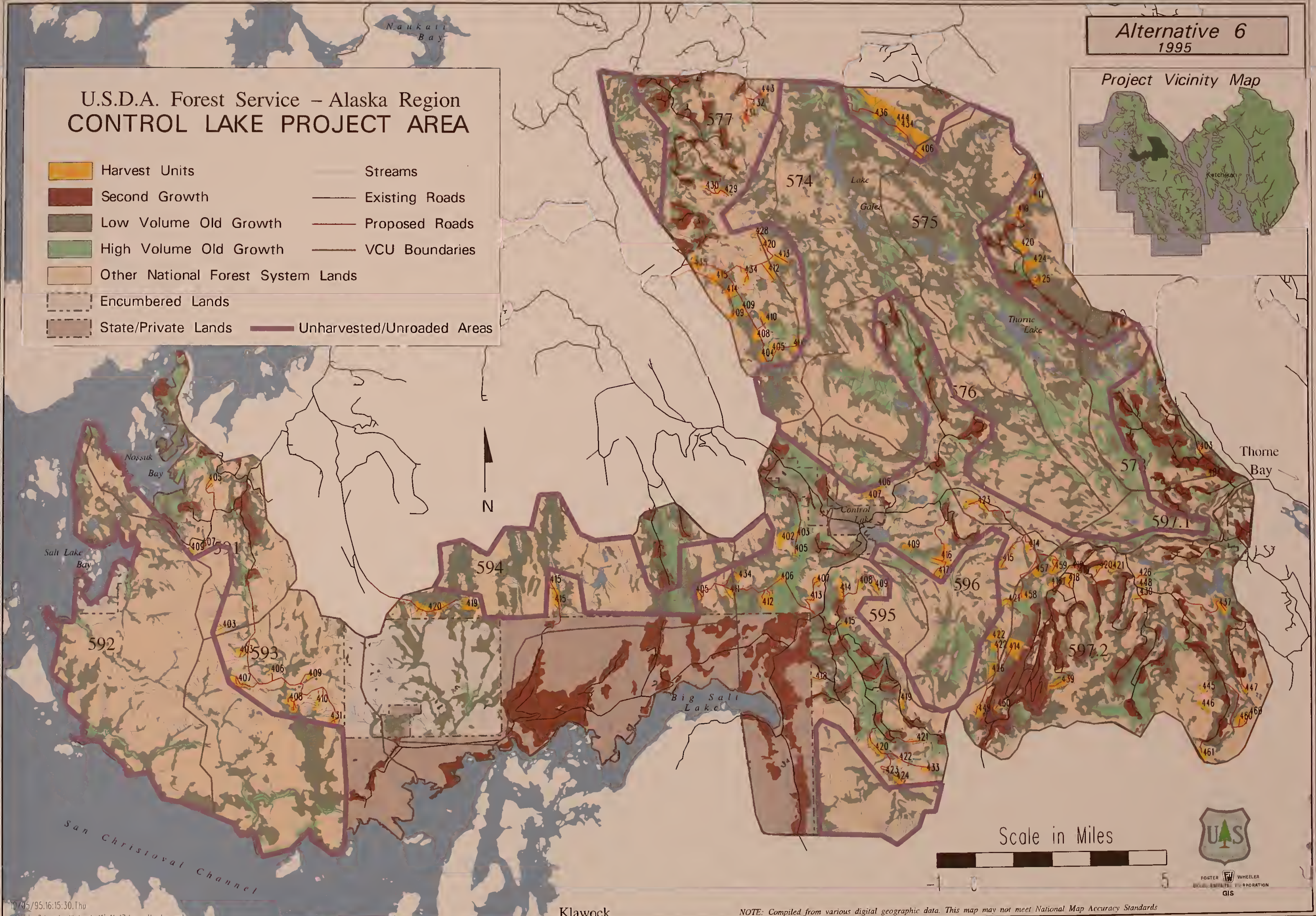
Alternative 6 1995

Project Vicinity Map



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- | | |
|--|--|
|  Harvest Units |  Streams |
|  Second Growth |  Existing Roads |
|  Low Volume Old Growth |  Proposed Roads |
|  High Volume Old Growth |  VCU Boundaries |
|  Other National Forest System Lands | |
|  Encumbered Lands | |
|  State/Private Lands |  Unharvested/Unroaded Areas |





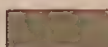



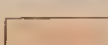





Scale in Miles



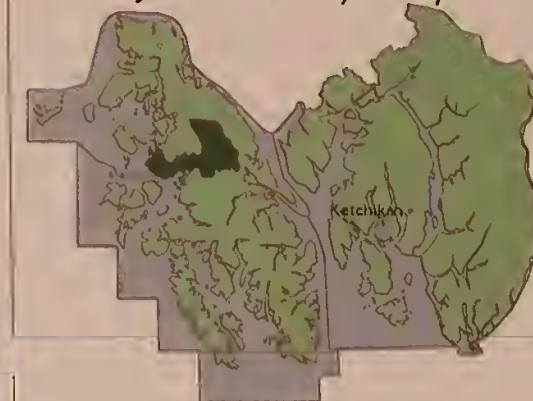
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- | | |
|--|--|
|  Harvest Units |  Streams |
|  Second Growth |  Existing Roads |
|  Low Volume Old Growth |  Proposed Roads |
|  High Volume Old Growth |  VCU Boundaries |
|  Other National Forest System Lands | |
|  Encumbered Lands | |
|  State/Private Lands |  Unharvested/Unroaded Areas |

Alternative 10
1995

Project Vicinity Map



Scale in Miles



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NOTE: Compiled from various digital geographic data. This map may not meet National Map Accuracy Standards.

Klawock

Appendix C

Harvest Unit Characteristics and Mitigation Measures

- **Unit, Alternative, Mitigation Measures**
- **Unit, Setting, Silvicultural Prescription,
Logging System**
- **Unit, Acres, Volume**

Alternatives		Mitigation Measures																C1*															
VCU-Unit	Alt. 2	Alt. 7	Alt. 8	Alt. 9	M1	M2*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	T1	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12*	V1	V2	V3	R1
574-401	1	1	1	1		1					1	1		1	1	1			1									1	1				1
574-403	1	1	1	1			1				1	1		1	1	1							1					1					1
574-404	1	1	1	1			1				1	1		1	1	1		1					1					1					1
574-405	1	1	1	1			1		1					1	1	1							1					1					1
574-406	1	1	1	1	0					1				1	1	1				1								1					1
574-407	1	1	1	1	1					1		1		1	1	1		1									1						1
574-408	1	1	1	1	0					1		1		1	1	1		1									1						1
574-409	1	1	1	1	0					1		1		1	1	1		1					1				1						1
574-413	1	1	1	1	1					1				1	1	1				1								1					1
574-414	1	1	1	1	0					1		1		1	1	1				1			1				1						1
574-415	1	1	0	0						1				1	1	1				1							1						1
574-416	1	1	0	0						1				1	1	1				1			1				1						1
574-417	1	1	0	0						1				1	1	1				1			1				1						1
574-420	1	1	1	1	1					1				1	1	1				1							1						1
574-421	1	1	1	1	0					1				1	1	1				1							1						1
574-422	1	1	1	0	0					1				1	1	1				1							1						1
574-424	1	1	0	0						1				1	1	1				1							1						1
574-425	1	1	0	0			1			1		1		1	1	1				1							1						1
574-426	1	1	0	0						1		1		1	1	1				1			1				1						1
574-427	1	1	0	0						1		1		1	1	1				1							1						1
574-428	1	1	0	0						1		1		1	1	1				1							1						1
574-429	1	1	1	1	1					1		1		1	1	1		1					1				1						1
574-431	1	1	1	1	0					1				1	1	1		1					1				1						1
574-434	1	1	1	1	1					1		1		1	1	1				1			1				1						1
574-435	1	1	1	1	0					1		1		1	1	1		1					1				1						1
574-436	1	1	1	1	1					1		1		1	1	1				1			1				1						1
574-437	1	1	1	1	0					1		1		1	1	1				1			1				1						1
574-440	1	1	0	0						1				1	1	1				1							1						1
574-441	1	1	0	0						1		1		1	1	1		1				1					1						1
574-442	1	1	0	0						1				1	1	1		1				1					1						1
574-443	1	1	1	1	1					1		1		1	1	1		1					1				1						1
574-444	1	1	1	1	1			1	1	1	1	1	1	1	1	1											1						1
575-403	1	1	0	0			1							1	1	1				1							1						1
575-404	1	1	0	0								1	1	1	1	1		1			1						1						1
575-406	1	1	1	1						1		1		1	1	1							1				1						1
575-407	1	1	0	0			1		1	1	1			1	1	1		1									1						1
575-408	1	1	0	0						1				1	1	1		1									1						1
575-409	1	1	0	1			1							1	1	1							1				1						1
575-410	1	1	1	1	1						1	1		1	1	1		1									1						1
575-411	1	1	1	1	1			1	1					1	1	1											1						1
575-412	1	1	1	1	1						1	1		1	1	1											1						1
575-413	1	1	1	1	1					1		1		1	1	1				1							1						1
575-414	1	1	1	1	0					1		1		1	1	1											1						1
575-415	1	1	0	0			1			1		1		1	1	1											1						1
575-417	1	1	1	1	0				1					1	1	1		1									1						1
575-418	1	1	1	1	1									1	1	1				1							1						1
575-419	1	1	1	1	1			1	1	1				1	1	1				1							1						1
575-420	1	1	1	1	1									1	1	1				1							1						1
575-421	1	1	0	0					1		1			1	1	1				1			1				1						1
575-422	1	1	0	0					1			1		1	1	1				1							1						1
575-423	1	1	0	0						1				1	1	1		1									1						1
575-424	1	1	1	1	1							1		1	1	1				1							1						1
575-425	1	1	1	1	1							1		1	1	1				1							1						1
575-428	1	1	0	0						1				1	1	1		1									1						1

Alternatives		Mitigation Measures																														
VCU-Unit	Alt. 2/Alt. 7/Alt. 8/Alt. 9	M1	M2*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	T1	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12*	V1	V2	V3	R1	C1*	
575-429	1 1 0 0			1					1	1						1	1							1				1			1	
575-430	1 1 0 0					1		1		1	1				1		1							1			1				1	
575-432	1 1 0 0						1	1			1				1	1								1							1	
575-433	1 1 0 0								1		1					1								1				1				1
575-436	1 1 0 0					1	1	1	1	1	1				1	1							1	1	1	1	1	1	1	1	1	
575-437	1 1 0 0					1	1	1	1		1		1			1			1					1	1						1	
575-438	1 1 0 0						1	1	1		1							1						1							1	
575-439	1 1 0 0			1		1		1			1		1					1	1					1							1	
576-401	1 1 1 0						1		1		1								1					1	1						1	
576-402	1 1 1 0			1			1	1	1		1				1	1			1					1	1						1	
576-405	1 1 1 0			1			1	1	1	1	1		1		1				1					1	1						1	
576-409	1 1 1 0						1				1													1								1
576-410	1 1 0 0			1																				1								1
576-411	1 1 0 0					1	1	1	1		1					1						1		1							1	
576-413	1 1 0 0						1	1			1													1								1
576-414	1 1 0 0						1	1			1													1								1
576-415	1 1 0 0						1		1		1						1		1					1	1							1
576-416	1 1 1 0						1	1	1	1	1		1					1						1	1							1
576-417	1 1 1 0						1	1	1	1	1		1				1		1			1		1								1
576-418	1 1 1 0						1	1	1	1	1		1		1									1								1
576-419	1 1 1 0						1	1	1	1	1							1		1				1								1
576-420	1 1 1 0						1	1	1		1							1	1					1								1
576-422	1 1 1 0										1					1			1					1								1
576-423	1 0 1 0								1	1	1							1	1					1								1
576-424	1 1 1 0						1	1	1		1							1	1					1								1
576-425	1 1 1 1						1	1	1	1	1		1					1				1										1
576-427	1 1 1 0								1		1														1							1
576-429	1 1 1 0										1														1							1
576-431	1 1 1 0					1	1	1	1		1					1								1								1
576-432	1 1 0 0					1	1	1	1	1	1					1			1					1								1
576-433	1 1 0 0					1	1	1	1	1	1					1								1								1
576-434	1 1 0 0					1	1	1	1	1	1					1			1					1								1
577-404	1 1 1 1			1		1	1	1	1				1						1					1								1
577-405	1 1 1 1			1		1	1	1	1										1					1								1
577-406	1 1 1 1			1		1	1	1	1										1					1								1
577-408	1 1 1 1			1					1										1					1								1
577-409	1 1 1 1			1					1					1					1					1								1
577-410	1 1 1 1			1											1				1					1								1
577-411	1 1 1 1			1		1												1						1								1
577-412	1 1 1 1			1				1	1									1		1				1								1
577-413	1 1 1 1			1				1			1		1						1					1								1
577-414	1 1 1 1			1					1		1								1					1								1
577-415	1 1 1 1			1					1		1								1					1								1
577-416	1 1 1 0						1		1		1								1					1								1
577-417	1 1 1 0						1		1		1								1					1								1
577-418	1 1 1 0						1		1		1								1					1								1
577-423	1 1 0 0						1												1					1								1
577-425	1 1 1 0						1		1		1								1					1								1
577-426	1 1 1 0							1	1		1								1					1								1
577-428	1 1 1 1										1					1								1								1
577-429	1 1 1 1							1			1								1					1								1
577-430	1 1 1 1						1	1	1		1				1			1						1								1
577-431	1 1 1 1										1								1					1								1
577-432	1 1 1 1							1			1								1					1								1

VCU-Unit	Alternatives				M2**	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	T1	W1	W2	W3	W4	Mitigation Measures								V1	V2	V3	R1	C1*
	Alt. 2/Alt. 7/Alt. 8/Alt. 9	M1	M2**	F1																	F2	F3	F4	F5	F6	F7	F8	F9					
577-434	1	1	1	1						1			1		1							1			1						1		
577-435	1	1	1	1						1	1		1		1				1			1			1						1		
578-401	1	1	1	1						1			1		1				1					1							1		
578-402	1	1	1	1	0						1		1		1				1					1			1				1		
578-403	1	1	1	1	1								1		1				1				1			1					1		
578-404	1	1	1	1	1				1				1		1				1				1			1					1		
591-403	1	0	1	1	1						1								1					1							1		
591-405	1	0	1	1	1			1		1			1		1							1		1							1		
591-407	1	0	1	1	1				1	1			1		1							1		1							1		
591-409	1	0	1	1	1								1									1									1		
592-401	1	0	0	0				1			1		1		1					1				1							1		
592-402	1	0	0	0				1		1	1	1										1		1							1		
592-403	1	0	0	0					1						1				1					1							1		
592-404	1	0	0	0				1		1			1		1					1				1							1		
592-405	1	0	0	0									1		1						1			1							1		
592-406	1	0	0	0									1		1					1				1							1		
592-407	1	0	0	0				1		1	1		1		1				1				1		1						1		
592-408	1	0	0	0					1		1		1		1					1			1		1						1		
592-409	1	0	0	0									1		1					1			1		1						1		
592-410	1	0	0	0							1		1		1					1			1		1						1		
592-411	1	0	0	0						1	1										1			1							1		
592-413	1	0	0	0				1		1	1								1				1		1						1		
592-414	1	0	0	0					1		1								1					1							1		
593-401	1	0	1	0					1				1		1								1								1		
593-402	1	0	1	1				1		1	1		1		1			1		1			1								1		
593-403	1	0	1	1					1		1		1		1				1				1								1		
593-406	1	0	1	1						1			1		1				1				1								1		
593-407	1	0	1	1				1		1	1		1		1						1			1							1		
593-408	1	0	1	1					1		1		1		1				1				1								1		
593-409	1	0	1	1					1		1		1		1						1			1							1		
593-410	1	0	1	1						1	1				1					1			1								1		
593-417	1	0	1	1							1				1						1			1							1		
593-418	1	0	1	1					1		1		1		1						1			1							1		
593-419	1	0	0	0					1		1		1		1						1			1							1		
593-420	1	0	0	0						1			1		1				1				1								1		
593-421	1	0	0	0							1		1		1				1				1			1					1		
593-422	1	0	0	0						1	1		1		1				1				1			1					1		
593-424	1	0	0	0					1		1		1		1				1				1			1					1		
593-425	1	0	0	0																			1			1					1		
593-426	1	0	0	0					1						1						1			1			1				1		
593-430	1	0	0	0						1					1								1		1						1		
593-431	1	0	1	1						1	1		1		1						1			1							1		
594-401	1	1	1	1					1		1	1					1			1													
594-405	1	1	1	1					1		1		1								1												
594-407	1	1	1	1				1			1		1						1														
594-409	1	1	1	1				1		1			1		1				1														
594-410	1	1	1	1				1		1			1		1				1														
594-411	1	1	1	1				1		1			1		1				1														
594-412	1	1	1	1				1		1			1		1				1														
594-413	1	1	1	1				1		1			1		1				1														
594-415	1	1	1	1					1		1		1		1					1													
594-416	1	1	1	1					1		1		1		1					1													
594-417	1	1	1	1						1			1		1				1														
594-418	1	1	1	1							1		1		1				1														

VCU-Unit	Alternatives				Mitigation Measures																	V1	V2	V3	R1	C1*						
	Alt. 2	Alt. 7	Alt. 8	Alt. 9	M1	M2*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	T1	W1	W2	W3	W4						W5	W6	W7	W8	W9	W10
594-419	1	1	1	1			1	1	1	1	1	1			1						1		1									
594-420	1	1	1	1			1		1		1	1	1										1									
595-402	1	1	1	1							1	1							1	1							1					1
595-403	1	1	1	1					1		1	1	1	1	1				1	1		1					1					1
595-405	1	1	1	1							1	1	1	1	1						1						1					1
595-406	1	1	1	1							1	1	1	1	1						1						1					1
595-407	1	1	1	1							1	1	1	1	1							1										
595-408	1	1	1	1							1	1	1	1	1							1										
595-409	1	1	1	1							1	1	1	1	1																	
595-410	1	1	1	0			1				1	1		1	1				1	1			1					1				1
595-411	1	1	1	1							1	1	1	1	1						1						1					1
595-412	1	1	1	1			1				1	1	1	1	1						1		1				1					1
595-413	1	1	1	1							1	1	1	1	1							1										
595-414	1	1	1	1							1	1	1	1	1							1										
595-415	1	1	1	1							1	1	1	1	1							1										
595-416	1	1	1	0							1	1	1	1	1							1										
595-418	1	1	1	1								1	1	1	1						1											
595-419	1	1	1	1								1	1	1	1							1										
595-420	1	1	1	1							1	1	1	1	1				1	1			1									
595-421	1	1	1	1							1	1	1	1	1						1											
595-422	1	1	1	1							1	1	1	1	1							1						1				
595-423	1	1	1	1			1		1		1	1	1	1	1				1													
595-424	1	1	1	1			1		1		1	1	1	1	1							1										
595-431	1	1	1	0							1	1	1	1	1						1											
595-433	1	1	1	1							1	1	1	1	1							1										
595-434	1	1	1	1								1	1	1	1							1						1				1
596-401	1	1	1	0			1		1			1	1	1	1				1	1								1				1
596-402	1	1	1	0			1		1			1	1	1	1				1	1								1				1
596-403	1	1	1	0			1		1		1	1	1	1	1				1	1								1				1
596-404	1	1	1	0					1			1	1	1	1						1							1				1
596-406	1	1	0	1								1	1	1	1							1						1				1
596-407	1	1	1	1								1	1	1	1						1							1				1
596-409	1	0	1	0					1		1	1	1	1	1							1						1				1
596-410	1	0	1	0					1		1	1	1	1	1						1							1				1
596-412	1	1	1	0							1	1	1	1	1							1						1				1
596-413	1	0	0	0							1	1	1	1	1							1						1				1
596-414	1	0	1	1							1	1	1	1	1						1							1				1
596-415	1	0	1	1							1	1	1	1	1													1				1
596-416	1	0	1	0							1	1	1	1	1							1						1				1
596-417	1	0	1	0					1		1	1	1	1	1				1	1			1					1				1
596-418	1	0	1	0							1	1	1	1	1				1				1					1				1
596-419	1	0	1	0							1	1	1	1	1							1						1				1
596-420	1	0	1	0							1	1	1	1	1				1				1					1				1
596-421	1	0	1	1			1		1		1	1	1	1	1							1						1				1
596-422	1	0	1	1							1	1	1	1	1							1						1				1
596-423	1	0	1	0							1	1	1	1	1							1						1				1
596-424	1	0	0	0			1		1		1	1	1	1	1						1							1				1
596-425	1	0	0	0							1	1	1	1	1							1						1				1
596-426	1	0	1	1							1	1	1	1	1							1					1					1
597.1-401	1	1	1	1							1	1	1	1	1				1	1								1				1
597.1-402	1	1	1	1							1	1	1	1	1				1	1								1				1
597.1-403	1	1	1	1							1	1	1	1	1				1	1								1				1
597.1-404	1	1	1	0							1	1	1	1	1													1				1
597.1-406	1	1	1	0							1	1	1	1	1													1				1

Alternatives		Mitigation Measures																			C1*													
VCU-Unit	Alt. 2	Alt. 7	Alt. 8	Alt. 9	M1	M2*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	T1	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12*	V1	V2	V3	R1	
597.1-407	1	1	1	1						1	1			1		1							1											
597.1-409	1	1	1	1	0						1			1		1			1			1												
597.1-410	1	1	1	1	1					1				1		1																		
597.2-414	1	1	1	1	1				1			1		1									1											
597.2-416	1	1	1	1	1						1			1									1											
597.2-417	1	1	1	1	0						1			1								1												
597.2-418	1	1	1	1	1						1			1		1							1											
597.2-419	1	1	1	1	1						1			1								1												
597.2-420	1	1	1	1	1				1					1									1											
597.2-421	1	1	1	1	1						1			1					1									1						
597.2-422	1	1	1	1	1						1			1					1			1												
597.2-424	1	1	1	1	0						1			1																				
597.2-425	1	1	1	1	1	0					1			1					1															
597.2-426	1	1	1	1	1						1			1		1			1															
597.2-427	1	1	1	1	1						1			1		1			1									1						
597.2-428	1	1	1	1	1						1			1									1											
597.2-430	1	1	1	1	1						1			1								1												
597.2-431	1	1	1	1	1				1			1		1									1											
597.2-434	1	1	1	1	1					1		1		1		1			1															
597.2-435	1	1	1	1	1					1		1		1		1						1												
597.2-437	1	1	1	1	1					1				1		1			1			1												
597.2-438	1	1	1	1	1						1			1		1			1				1											
597.2-439	1	1	1	1	1		1		1			1		1									1											
597.2-445	1	1	1	1	1						1			1																				
597.2-446	1	1	1	1	1						1			1																				
597.2-447	1	1	1	1	1											1																		
597.2-448	1	1	1	1	1					1				1				1				1												
597.2-449	1	1	1	1	1							1		1									1											
597.2-450	1	1	1	1	1				1		1			1				1				1												
597.2-457	1	1	1	1	1							1		1								1												
597.2-458	1	1	1	1	1							1		1									1											
597.2-459	1	1	1	1	1					1		1		1		1							1											
597.2-460	1	1	1	1	1						1			1		1							1											
597.2-461	1	1	1	1	1						1			1								1												

* Specific units are not identified for these measures to maintain confidentiality of location.

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CONTROL LAKE PROJECT UNIT POOL				
VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
574-401	A	I	RS	10.3
574-401	A	I	RS	11.0
574-403	A	A	RS	3.8
574-404	A	A	RS	12.7
574-404	B	A	RS	6.9
574-405	A	A	RS	19.1
574-406	A	B	SH	7.5
574-406	B	B	RS	6.4
574-407	A	F	RS	17.4
574-408	A	B	SL	4.7
574-408	B	B	SL	16.1
574-408	C	B	SL	20.1
574-408	D	B	SL	3.6
574-409	A	B	RS	41.7
574-409	B	I	RS	10.5
574-413	A	A	SH	39.4
574-413	B	A	RS	14.1
574-414	A	I	HE	17.3
574-414	B	C	HE	9.3
574-415	A	A	RS	16.2
574-415	A	I	RS	0.3
574-415	B	C	RS	10.1
574-415	B	I	RS	1.8
574-416	A	C	SH	46.0
574-416	A	I	SH	15.6
574-417	A	B	SH	19.9
574-420	A	A	RS	24.6
574-420	B	E	RS	14.9
574-421	A	I	HE	0.3
574-421	A	I	HE	1.2
574-421	A	I	HE	6.8
574-421	A	I	HE	32.0
574-422	A	I	RS	8.0
574-424	A	I	RS	7.6
574-424	B	I	RS	1.6
574-425	A	G	RS	7.9
574-426	A	A	RS	14.6
574-426	B	G	RS	11.0
574-427	A	F	LS	8.9
574-427	B	F	LS	9.2
574-427	B	I	LS	0.1
574-427	C	F	LS	7.7
574-427	D	I	SH	36.1
574-428	A	E	SH	14.3
574-428	A	I	SH	2.2
574-429	A	A	HL	12.3
574-429	B	A	HL	14.7
574-429	C	A	HL	19.7
574-431	A	A	RS	8.6
574-431	B	A	RS	28.9
574-434	A	A	HL	11.6
574-434	B	A	HL	15.8
574-434	C	A	HL	3.9
574-434	D	A	HL	20.4
574-434	E	A	HL	10.2
574-435	A	A	LS	6.5
574-435	B	A	LS	8.6

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
574-435	C	A	SL	12.0
574-435	D	A	SL	2.8
574-436	A	A	SL	15.9
574-436	B	A	LS	14.7
574-437	A	A	LS	10.4
574-437	B	A	HL	14.8
574-437	C	A	HL	8.5
574-440	A	I	RS	45.0
574-441	A	E	RS	17.0
574-441	B	B	RS	29.2
574-442	A	B	HL	4.1
574-442	B	B	HL	4.8
574-442	C	B	HL	8.1
574-442	D	B	HL	3.4
574-442	E	B	HL	8.3
574-443	A	E	RS	12.9
574-443	B	A	SH	2.6
574-444	A	I	HE	356.8
575-403	A	G	HE	24.9
575-404	A	B	HL	8.5
575-404	B	A	HL	7.2
575-404	C	C	HE	5.8
575-404	D	B	HL	3.5
575-404	E	B	HL	10.4
575-406	A	A	HL	9.7
575-406	B	A	HL	14.0
575-406	C	A	HL	4.3
575-406	D	A	LS	4.1
575-406	E	A	LS	7.0
575-406	F	A	LS	6.2
575-407	A	B	SL	27.4
575-407	B	B	SL	27.0
575-408	A	B	RS	10.7
575-408	B	B	HL	18.4
575-408	C	B	RS	8.5
575-408	D	B	HL	21.0
575-408	E	B	HL	10.6
575-409	A	A	RS	28.9
575-410	A	A	RS	32.3
575-411	A	A	SL	12.4
575-411	B	A	SL	6.0
575-412	A	A	HL	9.8
575-412	B	A	HL	21.1
575-413	A	F	RS	24.9
575-413	B	F	RS	9.7
575-414	A	B	RS	16.0
575-415	A	B	RS	38.0
575-417	A	G	RS	41.3
575-417	B	G	RS	17.9
575-418	A	A	RS	20.2
575-418	B	F	RS	24.7
575-419	A	A	RS	6.9
575-419	B	A	RS	13.9
575-419	C	A	RS	10.6
575-419	D	A	RS	11.8
575-420	A	I	HE	36.6
575-420	B	A	RS	21.2
575-421	A	B	SL	12.8
575-421	B	B	SL	19.2

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
575-421	C	G	RS	13.7
575-422	A	I	HE	17.4
575-422	B	H	RS	1.0
575-422	B	H	RS	8.1
575-423	A	F	RS	34.8
575-424	A	I	HE	36.3
575-424	B	A	SH	25.3
575-424	C	A	RS	9.1
575-425	A	I	HE	14.0
575-425	B	B	RS	33.4
575-428	A	G	HE	16.8
575-429	A	I	HE	1.7
575-429	A	I	HE	47.7
575-429	B	C	HE	21.2
575-430	A	C	SL	10.4
575-430	B	C	SL	6.2
575-432	A	F	RS	32.7
575-433	A	I	HE	86.3
575-436	A	H	RS	14.6
575-436	A	I	RS	6.0
575-437	A	F	SH	52.4
575-438	A	B	SL	14.1
575-439	A	B	SL	14.7
575-439	B	B	SL	14.9
576-401	A	A	SL	20.6
576-402	A	A	RS	15.0
576-402	B	A	RS	2.0
576-405	A	A	SL	11.4
576-405	B	A	SL	7.3
576-405	C	A	SL	18.2
576-405	D	A	SL	14.2
576-409	A	E	RS	23.0
576-409	B	E	RS	15.3
576-410	A	F	HE	13.9
576-411	A	H	RS	50.5
576-413	A	H	RS	42.7
576-414	A	H	SH	16.9
576-415	A	A	RS	23.4
576-415	B	C	SH	13.7
576-416	A	B	RS	56.7
576-416	B	B	SH	8.9
576-417	A	A	RS	11.1
576-417	A	I	RS	1.6
576-417	B	C	SH	11.3
576-417	B	I	SH	12.0
576-418	A	B	LS	42.4
576-418	A	I	LS	0.2
576-419	A	A	SH	6.3
576-420	A	A	RS	51.0
576-420	A	I	RS	12.7
576-422	A	B	RS	34.0
576-422	B	G	RS	17.9
576-423	A	E	RS	43.0
576-423	B	B	RS	32.6
576-424	A	B	RS	27.3
576-424	B	B	RS	9.6
576-425	A	B	RS	13.3
576-427	A	H	RS	3.1
576-427	B	H	SH	0.5

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
576-427	B	H	SH	7.7
576-427	C	H	SH	7.6
576-427	C	H	SH	8.5
576-429	A	C	SH	12.4
576-429	B	C	RS	5.2
576-431	A	G	HE	35.1
576-431	A	I	HE	0.7
576-432	A	B	SL	6.1
576-432	B	B	SL	4.6
576-432	C	B	SL	13.5
576-432	D	H	SL	4.4
576-432	E	H	SL	2.4
576-432	F	H	SL	2.8
576-433	A	B	SL	6.0
576-433	B	B	SL	11.6
576-433	C	B	SL	3.9
576-433	D	H	SL	5.1
576-433	E	H	SL	20.6
576-433	F	H	SL	8.1
576-434	A	B	RS	4.9
576-434	B	B	LS	6.5
576-434	C	B	LS	9.4
576-434	D	E	LS	6.4
576-434	E	E	LS	5.3
577-404	A	A	RS	19.8
577-404	B	A	SH	5.0
577-405	A	A	LS	22.1
577-405	B	A	LS	17.0
577-405	C	A	SL	11.2
577-405	D	A	SL	3.6
577-406	A	A	LS	11.7
577-406	B	A	LS	5.8
577-406	C	A	SL	18.2
577-406	D	A	SL	5.1
577-408	A	A	SL	17.5
577-408	B	A	SL	21.0
577-409	A	A	SH	30.5
577-409	B	A	HL	4.5
577-409	C	A	SL	16.6
577-409	D	A	SL	11.2
577-410	A	A	SL	16.0
577-410	B	A	SL	15.9
577-411	A	C	HE	28.8
577-412	A	C	HE	14.2
577-412	B	A	RS	35.7
577-413	A	A	RS	41.3
577-414	A	A	LS	15.8
577-414	B	A	SL	19.6
577-414	C	A	LS	12.3
577-414	D	A	SL	9.7
577-415	A	A	LS	4.3
577-415	B	A	LS	11.8
577-415	C	A	HL	15.4
577-415	D	A	LS	11.2
577-415	E	A	HL	19.1
577-415	F	A	LS	6.1
577-415	G	A	SH	13.8
577-416	A	E	SH	15.8
577-416	B	E	SH	17.7

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
577-416	B	I	SH	4.9
577-417	A	I	SH	8.9
577-418	A	E	SH	36.2
577-423	A	A	SH	15.2
577-423	A	I	SH	19.6
577-425	A	A	RS	27.2
577-425	A	I	RS	9.7
577-425	B	A	SH	9.7
577-426	A	A	RS	25.7
577-428	A	A	RS	12.4
577-429	A	E	RS	0.0
577-429	A	E	RS	15.9
577-429	A	I	RS	11.9
577-430	A	B	RS	13.4
577-431	A	A	RS	22.4
577-432	A	E	RS	15.1
577-434	A	A	SH	11.8
577-434	B	A	RS	32.1
577-435	A	A	SL	12.8
577-435	B	A	LS	16.3
577-435	B	I	LS	0.2
577-435	C	A	SL	15.9
578-401	A	G	RS	79.9
578-401	A	I	RS	22.5
578-402	A	I	HE	27.6
578-402	B	C	HE	35.7
578-403	A	A	RS	15.7
578-404	A	A	SH	16.2
591-403	A	G	HE	21.0
591-405	A	A	SH	8.5
591-405	B	A	RS	18.5
591-407	A	A	HL	5.1
591-409	A	A	SL	4.9
591-409	B	A	RS	0.9
591-409	C	A	SL	2.0
592-401	A	B	RS	20.8
592-402	A	B	RS	31.5
592-403	A	C	HE	13.0
592-404	A	B	RS	14.9
592-405	A	A	RS	17.2
592-406	A	B	LS	9.9
592-406	B	B	LS	5.3
592-407	A	E	RS	34.5
592-407	B	E	LS	3.6
592-407	C	E	LS	14.6
592-408	A	B	SH	7.5
592-408	B	B	RS	9.0
592-409	A	B	RS	6.6
592-410	A	B	RS	22.9
592-411	A	B	HE	53.3
592-413	A	C	HE	8.0
592-413	B	C	HE	10.3
592-414	A	E	HE	10.7
593-401	A	I	RS	24.2
593-402	A	B	RS	23.7
593-402	B	B	RS	6.6
593-402	C	B	RS	16.7
593-403	A	B	HL	5.6
593-403	B	B	HL	23.5

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
593-406	A	E	RS	7.3
593-407	A	A	RS	17.2
593-407	B	A	HL	11.2
593-407	C	A	RS	12.1
593-407	D	A	RS	5.3
593-408	A	G	SH	33.9
593-408	B	G	RS	19.3
593-409	A	A	HL	5.9
593-409	B	A	HL	7.1
593-409	C	A	HL	3.9
593-410	A	B	SL	10.4
593-410	B	B	LS	13.6
593-410	C	B	LS	3.2
593-417	A	A	LS	4.7
593-417	B	A	LS	5.5
593-418	A	A	SL	6.1
593-418	B	A	SL	6.5
593-419	A	A	SH	25.6
593-419	B	A	RS	13.7
593-420	A	A	SL	12.5
593-420	B	A	SL	14.7
593-420	C	A	SL	21.4
593-420	D	I	SL	3.1
593-420	E	I	SL	9.1
593-421	A	I	RS	35.2
593-422	A	E	SH	22.7
593-422	B	E	RS	27.2
593-422	C	E	RS	13.5
593-424	A	E	SL	11.4
593-424	B	E	SL	12.8
593-424	C	E	SL	15.2
593-424	D	E	SL	12.3
593-424	E	E	SL	8.8
593-424	F	E	SL	14.0
593-424	G	E	SH	15.4
593-424	H	E	SH	14.0
593-425	A	I	HE	12.6
593-425	B	I	HE	16.8
593-426	A	A	RS	22.7
593-426	B	I	RS	9.9
593-430	A	E	SH	22.9
593-431	A	A	HL	8.3
593-431	B	A	HL	6.0
593-431	C	A	HL	3.0
593-431	D	A	HL	5.7
594-401	A	B	RS	49.7
594-405	A	B	LS	7.5
594-405	B	B	LS	13.2
594-405	C	B	LS	11.7
594-407	A	B	RS	22.8
594-409	A	B	RS	41.7
594-409	B	G	RS	26.6
594-410	A	B	SL	16.9
594-410	B	B	SL	4.9
594-410	C	B	SL	17.6
594-410	D	G	RS	13.5
594-411	A	A	SL	10.5
594-411	B	A	SL	7.3
594-411	C	A	SL	6.0

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
594-411	D	C	HE	27.4
594-412	A	B	RS	20.4
594-413	A	A	SL	5.4
594-413	B	A	SL	10.5
594-413	C	A	SL	9.6
594-413	D	A	SL	6.5
594-413	E	A	SL	4.9
594-415	A	B	LS	24.0
594-415	B	B	LS	12.0
594-415	C	B	HL	13.4
594-415	D	B	LS	6.7
594-415	E	B	HL	21.7
594-416	A	A	RS	67.0
594-417	A	I	HL	8.6
594-417	B	I	HL	17.8
594-417	C	I	HL	20.1
594-417	D	I	HL	9.0
594-418	A	C	HE	42.6
594-419	A	C	HE	47.8
594-420	A	A	SL	14.3
594-420	B	A	SL	13.3
594-420	C	A	SL	9.4
594-420	D	A	SL	6.2
594-420	E	A	SL	7.6
594-420	F	A	SL	8.5
594-420	G	A	SL	9.2
594-420	H	A	SL	13.5
594-420	I	A	SL	4.9
594-420	J	A	SL	4.1
595-402	A	I	HE	60.6
595-403	A	F	RS	22.6
595-405	A	B	RS	14.2
595-406	A	B	RS	31.2
595-407	A	A	LS	10.5
595-407	B	A	LS	15.4
595-408	A	A	RS	22.1
595-409	A	G	RS	27.5
595-410	A	E	HE	30.1
595-411	A	A	SL	3.2
595-411	B	A	LS	29.0
595-412	A	B	RS	19.9
595-412	B	B	LS	67.7
595-413	A	A	HL	7.4
595-413	B	A	HL	5.7
595-413	C	A	HL	4.3
595-414	A	A	HL	19.0
595-414	B	A	HL	16.9
595-414	C	A	HL	9.4
595-415	A	B	SL	18.8
595-416	A	I	RS	16.5
595-416	B	A	RS	28.3
595-418	A	B	RS	10.1
595-419	A	A	RS	34.4
595-420	A	G	SL	5.4
595-420	B	G	SL	1.9
595-420	C	A	HL	8.8
595-420	D	A	HL	10.7
595-420	E	G	SL	11.5
595-420	F	G	SL	7.9

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
595-420	G	A	HL	7.8
595-420	H	A	HL	5.9
595-421	A	B	SL	2.4
595-421	B	B	SL	6.8
595-421	C	B	SL	2.8
595-421	D	B	RS	17.1
595-421	E	I	RS	2.3
595-421	F	B	RS	1.3
595-422	A	A	HL	8.7
595-423	A	E	RS	6.2
595-424	A	A	SL	4.6
595-424	B	A	SL	5.8
595-424	C	A	SL	9.8
595-424	D	A	LS	6.8
595-424	E	A	LS	3.3
595-424	F	A	LS	1.3
595-431	A	B	HL	14.0
595-431	B	B	HL	11.7
595-431	C	B	HL	26.7
595-431	D	B	HL	9.2
595-431	E	A	HL	14.2
595-431	F	A	HL	4.9
595-431	G	A	HL	4.0
595-433	A	A	HL	7.8
595-433	B	A	HL	12.4
595-433	C	A	HL	3.4
595-434	A	A	HL	17.9
595-434	B	A	HL	4.0
596-401	A	G	RS	18.4
596-402	A	A	RS	8.8
596-402	B	G	RS	15.8
596-403	A	A	LS	8.8
596-403	B	I	SH	3.9
596-404	A	G	HE	78.3
596-406	A	C	HE	4.1
596-406	A	C	HE	21.5
596-406	B	I	HE	29.0
596-407	A	I	HE	22.5
596-409	A	C	HE	28.5
596-410	A	A	RS	7.5
596-410	B	A	RS	4.8
596-410	C	A	RS	7.5
596-410	D	E	RS	2.7
596-410	E	E	RS	2.5
596-412	A	E	RS	20.7
596-412	B	E	SH	10.4
596-413	A	B	RS	39.2
596-414	A	F	RS	24.3
596-415	A	A	RS	46.9
596-416	A	A	LS	27.0
596-416	B	B	LS	20.7
596-416	C	B	LS	6.4
596-416	D	A	LS	5.3
596-416	E	A	SL	3.2
596-416	F	A	SL	8.3
596-416	G	A	SL	14.9
596-416	H	H	SH	15.6
596-417	A	A	LS	20.2
596-417	B	A	SH	7.1

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
596-417	C	A	LS	15.5
596-418	A	A	RS	8.3
596-419	A	A	LS	21.2
596-419	B	A	LS	24.4
596-419	C	A	LS	36.3
596-420	A	A	LS	39.1
596-420	B	A	LS	25.2
596-420	C	A	LS	21.1
596-421	A	A	SL	6.2
596-421	B	A	SL	8.6
596-421	C	A	SL	7.1
596-421	D	A	SL	8.3
596-422	A	A	LS	13.0
596-422	B	A	LS	17.9
596-422	C	A	LS	32.4
596-422	D	A	SL	18.9
596-423	A	A	LS	18.8
596-423	B	A	LS	15.1
596-423	C	A	LS	26.6
596-423	D	A	LS	21.3
596-423	E	A	LS	6.4
596-424	A	F	HE	74.6
596-425	A	F	HE	79.0
596-426	A	A	LS	30.9
596-426	B	A	LS	28.4
597.1-401	A	B	HL	8.8
597.1-401	A	I	RS	1.7
597.1-401	B	G	RS	33.2
597.1-402	A	F	SH	9.1
597.1-402	A	I	SH	5.1
597.1-403	A	F	SH	25.1
597.1-403	B	F	RS	16.6
597.1-404	A	G	RS	3.5
597.1-404	B	G	SH	16.4
597.1-404	B	I	SH	6.0
597.1-406	A	B	RS	11.6
597.1-406	A	I	RS	5.5
597.1-406	B	B	RS	26.8
597.1-407	A	A	RS	10.6
597.1-409	A	F	RS	11.8
597.1-410	A	B	SH	13.3
597.1-410	B	B	SH	15.5
597.2-414	A	A	LS	45.8
597.2-414	B	A	LS	37.2
597.2-414	C	A	SH	17.0
597.2-414	D	A	RS	11.8
597.2-416	A	A	SH	17.8
597.2-417	A	B	RS	3.0
597.2-417	B	B	SH	6.9
597.2-418	A	A	RS	40.8
597.2-419	A	A	RS	11.3
597.2-419	B	A	RS	6.1
597.2-420	A	B	RS	13.2
597.2-420	B	B	SH	6.8
597.2-421	A	A	RS	45.6
597.2-422	A	B	HL	10.7
597.2-422	A	I	HL	2.1
597.2-422	B	B	HL	9.5
597.2-422	B	I	HL	0.2

VCU/UNIT	SETTING	SILVICULTURAL SYSTEM	LOGGING SYSTEM	ACRES
597.2-424	A	G	RS	10.8
597.2-424	B	I	RS	5.0
597.2-425	A	G	RS	17.2
597.2-426	A	H	SH	12.4
597.2-427	A	E	SH	8.7
597.2-427	A	I	SH	1.8
597.2-427	B	E	RS	12.0
597.2-427	B	I	RS	4.4
597.2-427	B	I	RS	7.0
597.2-428	A	A	LS	8.1
597.2-428	B	A	LS	9.1
597.2-428	C	A	LS	5.2
597.2-428	D	A	LS	7.2
597.2-430	A	B	HL	12.9
597.2-430	B	B	HL	7.0
597.2-430	C	B	HL	6.4
597.2-431	A	A	RS	7.4
597.2-434	A	I	RS	1.6
597.2-434	A	I	RS	3.8
597.2-434	A	I	RS	42.3
597.2-435	A	B	RS	1.1
597.2-435	A	B	RS	3.2
597.2-435	A	I	RS	0.2
597.2-435	A	I	RS	7.9
597.2-435	B	B	RS	5.4
597.2-435	B	I	RS	3.6
597.2-435	C	B	SH	12.6
597.2-435	C	I	SH	0.6
597.2-437	A	I	RS	16.1
597.2-437	B	B	SH	19.9
597.2-437	C	I	RS	3.4
597.2-437	C	I	RS	4.6
597.2-437	D	B	RS	7.1
597.2-438	A	A	RS	12.4
597.2-438	B	A	SH	5.7
597.2-439	A	A	RS	74.3
597.2-445	A	C	HE	18.2
597.2-446	A	C	HE	26.7
597.2-447	A	B	RS	10.2
597.2-447	B	B	SH	6.2
597.2-448	A	B	SH	9.3
597.2-449	A	A	LS	8.5
597.2-449	B	A	LS	21.8
597.2-449	C	A	LS	18.5
597.2-449	D	A	LS	6.8
597.2-450	A	B	SL	7.1
597.2-450	B	B	SL	7.2
597.2-457	A	B	LS	30.6
597.2-458	A	A	HL	18.1
597.2-458	B	A	HL	22.1
597.2-459	A	A	RS	27.3
597.2-459	B	A	HL	30.8
597.2-460	A	A	RS	17.9
597.2-460	B	A	HL	27.5
597.2-460	C	A	HL	14.7
597.2-461	A	B	RS	7.6
597.2-461	B	B	HL	23.0
597.2-461	B	I	HL	3.7

		UNIT DATA									
		NO ADJUSTMENT				ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY					
		NO RETENTION ADJUSTMENT				ADJUSTED FOR RETENTION LEVEL					
		AVERAGE	TOTAL		AVERAGE	TOTAL	RETENTION	AVERAGE	TOTAL		
VCU	UNIT	MBF/ACRE	MBF	MBF/ACRE	MBF/ACRE	MBF	ADJ. FACTOR	MBF/ACRE	MBF	MBF	MBF
574	401	5.5	117.4		4.6	97.5	0.250	1.1	24.4		
574	403	31.1	118.5		25.8	98.3	1.000	25.8	98.3		
574	404	54.3	1,069.3		45.1	887.5	1.000	45.1	887.5		
574	405	34.4	657.2		28.5	545.4	1.000	28.5	545.4		
574	406	30.3	421.3		25.1	349.7	0.950	23.9	332.2		
574	407	38.7	671.9		32.1	557.7	0.900	28.9	501.9		
574	408	28.2	1,253.2		23.4	1,040.1	0.950	22.2	988.1		
574	409	33.4	1,741.8		27.7	1,445.7	0.809	22.4	1,169.8		
574	413	12.5	671.7		10.4	557.5	1.000	10.4	557.5		
574	414	29.6	787.6		24.6	653.7	0.545	13.4	356.2		
574	415	20.5	583.2		17.0	484.1	0.944	16.1	456.9		
574	416	13.5	835.0		11.2	693.0	0.810	9.1	561.2		
574	417	27.9	554.6		23.2	460.3	0.950	22.0	437.3		
574	420	15.1	595.7		12.5	494.4	0.962	12.0	475.8		
574	421	22.9	921.8		19.0	765.1	0.250	4.8	191.3		
574	422	26.8	214.7		22.2	178.2	0.250	5.6	44.6		
574	424	30.2	277.6		25.1	230.4	0.250	6.3	57.6		
574	425	30.4	240.7		25.2	199.7	0.700	17.7	139.8		
574	426	26.4	674.6		21.9	559.9	0.871	19.0	487.4		
574	427	23.0	1,426.5		19.1	1,184.0	0.462	8.8	546.9		
574	428	12.9	213.7		10.7	177.4	0.814	8.7	144.3		
574	429	43.7	2,038.7		36.3	1,692.2	1.000	36.3	1,692.2		
574	431	43.6	1,634.3		36.2	1,356.5	1.000	36.2	1,356.5		
574	434	41.5	2,485.5		34.4	2,063.0	1.000	34.4	2,063.0		
574	435	45.5	1,364.3		37.7	1,132.4	1.000	37.7	1,132.4		
574	436	46.0	1,408.6		38.2	1,169.2	1.000	38.2	1,169.2		
574	437	36.3	1,224.4		30.2	1,016.2	1.000	30.2	1,016.2		
574	440	14.6	655.0		12.1	543.6	0.250	3.0	135.9		
574	441	31.2	1,439.2		25.9	1,194.5	0.932	24.1	1,112.8		
574	442	28.8	825.8		23.9	685.4	0.950	22.7	651.2		
574	443	28.8	446.5		23.9	370.6	0.917	21.9	339.9		
574	444**	42.0	14,993.4		34.9	12,444.5	0.200	7.0	2,488.9		
575	403	43.3	1,079.5		36.0	895.9	0.700	25.2	627.2		
575	404	16.4	580.9		13.6	482.2	0.968	13.2	466.9		
575	406	40.8	1,846.9		33.8	1,533.0	1.000	33.8	1,533.0		
575	407	42.5	2,312.5		35.3	1,919.4	0.950	33.5	1,823.4		
575	408	26.9	1,859.1		22.3	1,543.0	0.950	21.2	1,465.9		

		UNIT DATA									
		NO ADJUSTMENT					ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY				
		NO RETENTION ADJUSTMENT					ADJUSTED FOR RETENTION LEVEL				
		TOTAL	AVERAGE	TOTAL	AVERAGE	TOTAL	RETENTION	AVERAGE	TOTAL		
VCU/UNIT	ACRES	MBF	MBF/ACRE	MBF	MBF/ACRE	MBF	ADJ. FACTOR	MBF/ACRE	MBF		
575 409	28.9	920.4	31.8	920.4	26.4	763.9	1.000	26.4	763.9		
575 410	32.3	1,521.6	47.1	1,521.6	39.1	1,262.9	1.000	39.1	1,262.9		
575 411	18.4	675.8	36.8	675.8	30.5	560.9	1.000	30.5	560.9		
575 412	30.9	880.9	28.5	880.9	23.7	731.2	1.000	23.7	731.2		
575 413	34.6	926.6	26.8	926.6	22.2	769.0	0.900	20.0	692.1		
575 414	16.0	825.0	51.4	825.0	42.7	684.7	0.950	40.5	650.5		
575 415	38.0	1,532.3	40.3	1,532.3	33.4	1,271.8	0.950	31.8	1,208.3		
575 417	59.2	933.1	15.8	933.1	13.1	774.4	0.700	9.2	542.1		
575 418	44.9	1,869.1	41.7	1,869.1	34.6	1,551.3	0.945	32.7	1,466.1		
575 419	43.2	1,058.6	24.5	1,058.6	20.3	878.7	1.000	20.3	878.7		
575 420	57.9	1,667.0	28.8	1,667.0	23.9	1,383.6	0.443	10.6	613.0		
575 421	45.7	2,298.8	50.3	2,298.8	41.7	1,908.0	0.875	36.5	1,670.2		
575 422	26.6	795.1	29.9	795.1	24.9	659.9	0.336	8.4	221.7		
575 423	34.8	819.0	23.5	819.0	19.5	679.8	0.900	17.6	611.8		
575 424	70.7	2,244.6	31.7	2,244.6	26.3	1,863.0	0.615	16.2	1,145.7		
575 425	47.3	2,370.2	50.1	2,370.2	41.6	1,967.2	0.743	30.9	1,462.6		
575 428	16.8	543.3	32.3	543.3	26.8	450.9	0.700	18.8	315.6		
575 429	70.6	2,899.4	41.1	2,899.4	34.1	2,406.5	0.475	16.2	1,143.1		
575 430	16.6	430.5	25.9	430.5	21.5	357.3	1.000	21.5	357.3		
575 432	32.7	1,092.5	33.4	1,092.5	27.7	906.8	0.900	25.0	816.1		
575 433 *	86.3	2,380.5	27.6	2,380.5	22.9	1,975.8	0.120	2.7	237.1		
575 436	20.6	571.6	27.8	571.6	23.1	474.5	0.427	9.9	202.8		
575 437	52.4	2,370.9	45.2	2,370.9	37.5	1,967.8	0.900	33.8	1,771.1		
575 438	14.1	469.1	33.3	469.1	27.7	389.3	0.950	26.3	369.9		
575 439	29.5	1,187.3	40.2	1,187.3	33.4	985.5	0.950	31.7	936.2		
576 401	20.6	690.9	33.5	690.9	27.8	573.4	1.000	27.8	573.4		
576 402	17.1	533.7	31.2	533.7	25.9	443.0	1.000	25.9	443.0		
576 405	51.2	2,252.0	44.0	2,252.0	36.5	1,869.1	1.000	36.5	1,869.1		
576 409	38.3	1,644.7	42.9	1,644.7	35.6	1,365.1	0.900	32.1	1,228.6		
576 410	13.9	249.8	18.0	249.8	14.9	207.3	0.900	13.4	186.6		
576 411	50.5	1,888.7	37.4	1,888.7	31.0	1,567.6	0.500	15.5	783.8		
576 413	42.7	1,210.0	28.3	1,210.0	23.5	1,004.3	0.500	11.8	502.1		
576 414	16.9	374.0	22.2	374.0	18.4	310.4	0.500	9.2	155.2		
576 415	37.1	1,295.0	34.9	1,295.0	29.0	1,074.8	1.000	29.0	1,074.8		
576 416	65.6	2,157.2	32.9	2,157.2	27.3	1,790.5	0.950	25.9	1,701.0		
576 417	36.0	662.8	18.4	662.8	15.3	550.1	0.718	11.0	394.9		
576 418	42.6	1,739.4	40.8	1,739.4	33.9	1,443.7	0.947	32.1	1,367.4		

	VCU UNIT	UNIT DATA									
		NO ADJUSTMENT					ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY				
		NO RETENTION ADJUSTMENT					ADJUSTED FOR RETENTION LEVEL				
		AVERAGE	TOTAL				AVERAGE	TOTAL	RETENTION	AVERAGE	TOTAL
	ACRES	MBF/ACRE	MBF	MBF/ACRE	MBF	MBF/ACRE	MBF/ACRE	MBF	ADJ. FACTOR	MBF/ACRE	MBF
576 419	6.3	27.9	176.6			23.2	146.6	146.6	1.000	23.2	146.6
576 420	63.7	31.9	2,030.9			26.4	1,685.7	1,685.7	0.850	22.5	1,433.3
576 422	51.9	32.5	1,685.8			27.0	1,399.2	1,399.2	0.864	23.3	1,208.4
576 423	75.6	23.5	1,780.8			19.5	1,478.0	1,478.0	0.922	18.0	1,362.1
576 424	36.9	30.3	1,118.1			25.2	928.1	928.1	0.950	23.9	881.7
576 425	13.3	35.6	474.4			29.5	393.8	393.8	0.950	28.0	374.1
576 427	27.4	28.1	770.9			23.3	639.9	639.9	0.500	11.7	319.9
576 429	17.6	41.1	724.3			34.1	601.2	601.2	1.000	34.1	601.2
576 431	35.8	47.8	1,710.7			39.7	1,419.9	1,419.9	0.600	23.8	852.0
576 432	33.8	34.5	1,168.7			28.7	970.0	970.0	0.822	23.6	797.3
576 433	55.4	26.3	1,457.1			21.8	1,209.4	1,209.4	0.675	14.7	816.4
576 434	32.5	47.9	1,558.9			39.8	1,293.9	1,293.9	0.932	37.1	1,205.9
577 404	24.9	36.1	898.6			30.0	745.8	745.8	1.000	30.0	745.8
577 405	53.8	46.8	2,518.1			38.8	2,090.0	2,090.0	1.000	38.8	2,090.0
577 406	40.8	38.1	1,551.0			31.6	1,287.3	1,287.3	1.000	31.6	1,287.3
577 407	25.4	29.0	734.5			24.0	609.6	609.6	1.000	24.0	609.6
577 408	38.5	29.0	1,118.6			24.1	928.4	928.4	1.000	24.1	928.4
577 409	62.8	38.0	2,386.8			31.6	1,981.0	1,981.0	1.000	31.6	1,981.0
577 410	31.9	50.9	1,623.9			42.2	1,347.9	1,347.9	1.000	42.2	1,347.9
577 411	28.8	37.9	1,091.8			31.4	906.2	906.2	1.000	31.4	906.2
577 412	49.9	29.6	1,475.7			24.5	1,224.8	1,224.8	1.000	24.5	1,224.8
577 413	41.3	20.8	858.9			17.3	712.9	712.9	1.000	17.3	712.9
577 414	57.3	45.8	2,625.3			38.0	2,179.0	2,179.0	1.000	38.0	2,179.0
577 415	81.8	39.9	3,266.4			33.1	2,711.1	2,711.1	1.000	33.1	2,711.1
577 416	38.3	29.5	1,130.8			24.5	938.5	938.5	0.818	20.0	767.3
577 417	8.9	16.5	147.8			13.7	122.7	122.7	0.250	3.4	30.7
577 418	36.2	29.8	1,079.4			24.8	895.9	895.9	0.900	22.3	806.3
577 423	34.8	33.1	1,151.2			27.4	955.5	955.5	0.577	15.8	551.5
577 425	46.6	16.1	753.1			13.4	625.1	625.1	0.843	11.3	527.3
577 426	25.7	28.0	719.1			23.2	596.9	596.9	1.000	23.2	596.9
577 428	12.4	27.0	334.8			22.4	277.8	277.8	1.000	22.4	277.8
577 429	27.8	23.7	658.9			19.7	546.9	546.9	0.622	12.3	340.2
577 430	13.4	10.0	134.4			8.3	111.6	111.6	0.950	7.9	106.0
577 431	22.4	22.8	511.4			18.9	424.5	424.5	1.000	18.9	424.5
577 432	15.1	20.2	304.4			16.7	252.6	252.6	0.900	15.1	227.4
577 434	43.9	11.7	514.0			9.7	426.6	426.6	1.000	9.7	426.6
577 435	45.2	32.0	1,447.6			26.6	1,201.5	1,201.5	0.997	26.5	1,198.1

		UNIT DATA									
		NO ADJUSTMENT				ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY					
		NO RETENTION ADJUSTMENT				ADJUSTED FOR RETENTION LEVEL					
VCU UNIT	TOTAL ACRES	AVERAGE MBF/ACRE	TOTAL MBF	AVERAGE MBF/ACRE	TOTAL MBF	RETENTION ADJ. FACTOR	AVERAGE MBF/ACRE	TOTAL MBF	RETENTION ADJ. FACTOR	AVERAGE MBF/ACRE	TOTAL MBF
578 401	102.4	32.0	3,280.3	26.6	2,722.6	0.601	16.0	1,636.4	0.601	16.0	1,636.4
578 402	63.3	43.9	2,782.7	36.5	2,309.6	0.629	23.0	1,453.7	0.629	23.0	1,453.7
578 403	15.7	30.2	472.3	25.0	392.0	1.000	25.0	392.0	1.000	25.0	392.0
578 404	16.2	23.4	378.3	19.4	314.0	1.000	19.4	314.0	1.000	19.4	314.0
591 403	21.0	12.0	252.0	9.9	209.2	0.700	7.0	146.4	0.700	7.0	146.4
591 405	27.0	42.8	1,153.5	35.5	957.4	1.000	35.5	957.4	1.000	35.5	957.4
591 407	5.1	28.7	145.2	23.8	120.6	1.000	23.8	120.6	1.000	23.8	120.6
591 409	7.7	16.4	126.5	13.6	105.0	1.000	13.6	105.0	1.000	13.6	105.0
592 401	20.8	26.1	542.7	21.7	450.4	0.950	20.6	427.9	0.950	20.6	427.9
592 402	31.5	14.0	441.0	11.6	366.0	0.950	11.0	347.7	0.950	11.0	347.7
592 403	13.0	18.8	245.0	15.6	203.3	1.000	15.6	203.3	1.000	15.6	203.3
592 404	14.9	26.5	394.7	22.0	327.6	0.950	20.9	311.2	0.950	20.9	311.2
592 405	17.2	22.1	379.9	18.3	315.3	1.000	18.3	315.3	1.000	18.3	315.3
592 406	15.1	29.6	447.5	24.5	371.5	0.950	23.3	352.9	0.950	23.3	352.9
592 407	52.7	21.2	1,118.3	17.6	928.1	0.900	15.8	835.3	0.900	15.8	835.3
592 408	16.5	22.5	369.6	18.6	306.7	0.950	17.7	291.4	0.950	17.7	291.4
592 409	6.6	31.2	205.1	25.9	170.2	0.950	24.6	161.7	0.950	24.6	161.7
592 410	22.9	19.7	451.0	16.4	374.3	0.950	15.5	355.6	0.950	15.5	355.6
592 411	53.3	18.6	993.4	15.5	824.5	0.950	14.7	783.3	0.950	14.7	783.3
592 413	18.3	18.2	332.9	15.1	276.3	1.000	15.1	276.3	1.000	15.1	276.3
592 414	10.7	14.1	151.4	11.7	125.6	0.900	10.5	113.1	0.900	10.5	113.1
593 401	24.2	12.8	311.0	10.7	258.2	0.250	2.7	64.5	0.250	2.7	64.5
593 402	46.9	18.6	870.6	15.4	722.6	0.950	14.6	686.5	0.950	14.6	686.5
593 403	29.1	29.3	852.0	24.3	707.1	0.950	23.1	671.8	0.950	23.1	671.8
593 406	7.3	37.9	275.3	31.5	228.5	0.900	28.3	205.6	0.900	28.3	205.6
593 407	45.9	29.2	1,341.4	24.3	1,113.4	1.000	24.3	1,113.4	1.000	24.3	1,113.4
593 408	53.3	48.4	2,579.1	40.2	2,140.6	0.700	28.1	1,498.4	0.700	28.1	1,498.4
593 409	16.9	24.8	418.6	20.6	347.5	1.000	20.6	347.5	1.000	20.6	347.5
593 410	27.1	39.2	1,062.3	32.5	881.7	0.950	30.9	837.6	0.950	30.9	837.6
593 417	10.2	20.4	208.2	17.0	172.8	1.000	17.0	172.8	1.000	17.0	172.8
593 418	12.7	37.3	472.1	31.0	391.8	1.000	31.0	391.8	1.000	31.0	391.8
593 419	39.3	39.3	1,543.5	32.6	1,281.1	1.000	32.6	1,281.1	1.000	32.6	1,281.1
593 420	60.9	26.2	1,595.8	21.8	1,324.6	0.850	18.5	1,125.5	0.850	18.5	1,125.5
593 421	35.2	33.8	1,190.8	28.1	988.4	0.250	7.0	247.1	0.250	7.0	247.1
593 422	63.4	29.9	1,894.9	24.8	1,572.7	0.900	22.3	1,415.5	0.900	22.3	1,415.5
593 424	103.7	33.6	3,482.2	27.9	2,890.2	0.900	25.1	2,601.2	0.900	25.1	2,601.2
593 425	29.4	21.2	624.7	17.6	518.5	0.250	4.4	129.6	0.250	4.4	129.6

	VCU UNIT	UNIT DATA									
		NO ADJUSTMENT					ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY				
		NO RETENTION ADJUSTMENT					ADJUSTED FOR RETENTION LEVEL				
		AVERAGE	TOTAL		AVERAGE	TOTAL	RETENTION	AVERAGE	TOTAL		
	ACRES	MBF/ACRE	MBF		MBF/ACRE	MBF	ADJ. FACTOR	MBF/ACRE	MBF		
593 426	32.6	32.9	1,073.3		27.3	890.8	0.772	21.1	687.6		
593 430	22.9	32.0	734.1		26.6	609.3	0.900	23.9	548.4		
593 431	22.9	12.9	296.2		10.7	245.8	1.000	10.7	245.8		
594 401	49.7	35.3	1,754.4		29.3	1,456.2	0.950	27.8	1,383.3		
594 405	32.3	29.2	945.6		24.3	784.8	0.950	23.1	745.6		
594 407	22.8	28.7	652.6		23.8	541.7	0.950	22.6	514.6		
594 409	68.3	35.4	2,416.7		29.4	2,005.8	0.853	25.0	1,710.3		
594 410	52.9	31.6	1,672.9		26.3	1,388.5	0.886	23.3	1,230.4		
594 411	51.3	37.0	1,897.6		30.7	1,575.0	1.000	30.7	1,575.0		
594 412	20.4	28.8	589.3		23.9	489.1	0.950	22.7	464.7		
594 413	36.9	49.4	1,824.5		41.0	1,514.3	1.000	41.0	1,514.3		
594 415	77.7	35.5	2,759.0		29.5	2,290.0	0.950	28.0	2,175.5		
594 416	67.0	24.0	1,609.9		19.9	1,336.2	1.000	19.9	1,336.2		
594 417	55.5	22.3	1,238.6		18.5	1,028.0	0.250	4.6	257.0		
594 418	42.6	27.6	1,178.0		22.9	977.8	1.000	22.9	977.8		
594 419	47.8	53.4	2,549.8		44.3	2,116.3	1.000	44.3	2,116.3		
594 420	91.0	40.3	3,671.6		33.5	3,047.4	1.000	33.5	3,047.4		
595 402	60.6	25.0	1,513.7		20.7	1,256.4	0.100	2.1	125.6		
595 403	22.6	53.1	1,199.6		44.1	995.7	0.900	39.7	896.1		
595 405	14.2	20.9	295.5		17.3	245.2	0.950	16.4	233.0		
595 406	31.2	48.9	1,525.4		40.6	1,266.1	0.950	38.5	1,202.8		
595 407	26.0	34.8	904.3		28.9	750.6	1.000	28.9	750.6		
595 408	22.1	29.0	641.4		24.1	532.3	1.000	24.1	532.3		
595 409	27.5	30.1	825.7		25.0	685.4	0.700	17.5	479.8		
595 410	30.1	34.6	1,043.9		28.7	866.4	0.900	25.9	779.8		
595 411	32.2	24.6	793.3		20.4	658.5	1.000	20.4	658.5		
595 412	87.6	42.7	3,739.3		35.4	3,103.6	0.950	33.7	2,948.4		
595 413	17.5	22.0	384.5		18.3	319.1	1.000	18.3	319.1		
595 414	45.4	35.2	1,595.8		29.2	1,324.5	1.000	29.2	1,324.5		
595 415	18.8	22.1	414.6		18.4	344.1	0.950	17.4	326.9		
595 416	44.7	19.8	886.6		16.4	735.9	0.724	11.9	532.8		
595 418	10.1	25.3	254.5		21.0	211.2	0.950	19.9	200.7		
595 419	34.4	40.7	1,402.8		33.8	1,164.4	1.000	33.8	1,164.4		
595 420	60.1	37.3	2,243.1		31.0	1,861.7	0.866	26.8	1,612.6		
595 421	32.6	32.4	1,056.2		26.9	876.6	0.901	24.2	789.9		
595 422	8.7	32.4	282.5		26.9	234.5	1.000	26.9	234.5		
595 423	6.2	28.0	174.5		23.2	144.9	0.900	20.9	130.4		

			UNIT DATA											
			NO ADJUSTMENT		ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY									
			NO RETENTION ADJUSTMENT				ADJUSTED FOR RETENTION LEVEL							
			TOTAL		AVERAGE		TOTAL		RETENTION		AVERAGE		TOTAL	
VCU UNIT			ACRES		MBF/ACRE		MBF		ADJ. FACTOR		MBF/ACRE		MBF	
595	424		31.6		32.4		1,023.3		26.9		1.000		26.9	849.4
595	431		84.6		43.1		3,643.7		35.7		0.964		34.4	2,914.3
595	433		23.6		48.8		1,154.8		40.5		1.000		40.5	958.5
595	434		21.9		37.0		808.0		30.7		1.000		30.7	670.6
596	401		18.4		35.7		655.2		29.6		0.700		20.7	380.7
596	402		24.6		36.1		886.9		30.0		0.807		24.2	594.4
596	403		12.7		33.1		420.6		27.5		0.769		21.1	268.4
596	404		78.3		36.8		2,887.0		30.6		0.700		21.4	1,677.4
596	406		54.6		37.1		2,026.2		30.8		0.575		17.7	966.6
596	407		22.5		11.4		255.6		9.4		0.200		1.9	42.4
596	409		28.5		46.7		1,330.6		38.7		1.000		38.7	1,104.4
596	410		24.9		20.1		499.2		16.7		0.979		16.3	405.7
596	412		31.1		30.2		938.5		25.0		0.900		22.5	701.1
596	413		39.2		31.0		1,214.0		25.7		0.950		24.4	957.2
596	414		24.3		28.0		681.1		23.3		0.900		20.9	508.8
596	415		46.9		31.3		1,465.2		25.9		1.000		25.9	1,216.1
596	416		101.3		31.5		3,192.5		26.2		0.910		23.8	2,410.1
596	417		42.8		45.0		1,926.6		37.3		1.000		37.3	1,599.1
596	418		8.3		13.5		112.2		11.2		1.000		11.2	93.1
596	419		82.0		44.1		3,617.6		36.6		1.000		36.6	3,002.6
596	420		85.5		52.9		4,525.0		43.9		1.000		43.9	3,755.7
596	421		30.1		33.5		1,010.1		27.8		1.000		27.8	838.4
596	422		82.2		62.7		5,156.5		52.1		1.000		52.1	4,279.9
596	423		88.2		40.9		3,609.4		34.0		1.000		34.0	2,995.8
596	424		74.6		32.8		2,449.4		27.3		0.900		24.5	1,829.7
596	425		79.0		60.0		4,737.5		49.8		0.900		44.8	3,538.9
596	426		59.3		33.0		1,956.9		27.4		1.000		27.4	1,624.2
597.1	401		43.8		39.4		1,726.0		32.7		0.733		24.0	1,049.5
597.1	402		14.2		39.9		568.9		33.1		0.666		22.1	314.4
597.1	403		41.8		25.4		1,062.7		21.1		0.900		19.0	793.8
597.1	404		25.9		39.1		1,012.5		32.5		0.596		19.4	501.3
597.1	406		43.9		40.6		1,785.2		33.7		0.863		29.1	1,278.4
597.1	407		10.6		34.9		371.3		29.0		1.000		29.0	308.2
597.1	409		11.8		49.3		579.4		40.9		0.900		36.8	432.8
597.1	410		28.8		23.7		681.8		19.6		0.950		18.7	537.6
597.2	414		111.9		51.1		5,722.6		42.4		1.000		42.4	4,749.8
597.2	416		17.8		24.5		434.8		20.3		1.000		20.3	360.9

			UNIT DATA									
			NO ADJUSTMENT					ADJUSTED FOR HIDDEN DEFECT, BREAKAGE, AND UTILITY				
			NO RETENTION ADJUSTMENT					ADJUSTED FOR RETENTION LEVEL				
			AVERAGE	TOTAL		AVERAGE	TOTAL	RETENTION	AVERAGE	TOTAL		
VCU UNIT	TOTAL ACRES	MBF/ACRE	MBF	MBF/ACRE	MBF	MBF/ACRE	MBF	ADJ. FACTOR	MBF/ACRE	MBF		
597.2 417	9.9	31.8	314.4	26.4	260.9	25.1	247.9	0.950	25.1	247.9		
597.2 418	40.8	18.4	752.4	15.3	624.5	15.3	624.5	1.000	15.3	624.5		
597.2 419	17.4	24.2	421.5	20.1	349.9	20.1	349.9	1.000	20.1	349.9		
597.2 420	20.0	24.8	494.2	20.6	410.2	19.5	389.7	0.950	19.5	389.7		
597.2 421	45.6	28.7	1,307.7	23.8	1,085.4	23.8	1,085.4	1.000	23.8	1,085.4		
597.2 422	22.4	33.3	746.4	27.6	619.5	24.3	544.6	0.879	24.3	544.6		
597.2 424	15.9	36.0	571.7	29.9	474.5	16.7	264.4	0.557	16.7	264.4		
597.2 425	17.2	44.6	767.0	37.1	636.6	25.9	445.6	0.700	25.9	445.6		
597.2 426	12.4	22.7	281.6	18.8	233.7	9.4	116.9	0.500	9.4	116.9		
597.2 427	34.0	28.6	972.7	23.8	807.4	15.3	520.6	0.645	15.3	520.6		
597.2 428	29.6	36.0	1,067.1	29.9	885.7	29.9	885.7	1.000	29.9	885.7		
597.2 430	26.3	11.6	304.2	9.6	252.5	9.1	239.9	0.950	9.1	239.9		
597.2 431	7.4	13.4	99.3	11.2	82.4	11.2	82.4	1.000	11.2	82.4		
597.2 434	47.7	34.9	1,665.9	29.0	1,382.7	7.2	345.7	0.250	7.2	345.7		
597.2 435	34.6	28.7	991.7	23.8	823.1	16.7	576.6	0.700	16.7	576.6		
597.2 437	51.1	26.4	1,347.5	21.9	1,118.4	13.6	693.1	0.620	13.6	693.1		
597.2 438	18.1	22.0	396.6	18.2	329.2	18.2	329.2	1.000	18.2	329.2		
597.2 439	74.3	36.5	2,714.4	30.3	2,253.0	30.3	2,253.0	1.000	30.3	2,253.0		
597.2 445	18.2	29.1	530.0	24.2	439.9	24.2	439.9	1.000	24.2	439.9		
597.2 446	26.7	20.3	540.7	16.8	448.7	16.8	448.7	1.000	16.8	448.7		
597.2 447	16.4	27.3	446.0	22.6	370.2	21.5	351.7	0.950	21.5	351.7		
597.2 448	9.3	28.5	263.8	23.6	218.9	22.5	208.0	0.950	22.5	208.0		
597.2 449	55.6	38.3	2,132.6	31.8	1,770.0	31.8	1,770.0	1.000	31.8	1,770.0		
597.2 450	14.3	23.9	340.7	19.8	282.8	18.8	268.6	0.950	18.8	268.6		
597.2 457	30.6	41.7	1,276.6	34.6	1,059.6	32.9	1,006.6	0.950	32.9	1,006.6		
597.2 458	40.2	38.5	1,547.0	31.9	1,284.0	31.9	1,284.0	1.000	31.9	1,284.0		
597.2 459	58.1	30.4	1,767.6	25.3	1,467.1	25.3	1,467.1	1.000	25.3	1,467.1		
597.2 460	60.1	65.4	3,933.4	54.3	3,264.8	54.3	3,264.8	1.000	54.3	3,264.8		
597.2 461	34.2	30.5	1,042.8	25.3	865.5	22.1	756.5	0.874	22.1	756.5		

Appendix D

Supplemental Resource Information

**Section D1—Project Area Soils by
Watershed**

**Section D2—Stream, Lake, and Estuarine
Buffer Table**

**Section D3—Individual Stream and
Watershed Descriptions**

**Section D4—Road Sediment Delivery by
Watershed**

Control Lake Project Area Soils by Watershed (acres)

<i>Watershed</i>	<i>Tonowek</i>	<i>McGilvery</i>	<i>Mineral</i>	<i>Organic</i>	<i>Till</i>
000Z	17	730	2,046	2,695	1,198
B59C	0	0	0	116	0
BS7A	0	7	12	83	0
BS8A	0	17	68	25	39
BS9A	0	0	0	0	0
BT1A	0	2	4	22	0
BT2A	8	63	186	274	58
BT6A	0	0	98	48	70
BT7A	0	3	58	98	40
BT8A	0	2	120	85	104
BT9A	0	59	43	227	43
BW1A	0	49	356	243	343
BW2A	0	36	299	121	235
BW3A	0	14	123	95	119
BW4A	0	0	3	38	3
BW5A	0	126	72	417	40
BW6A	0	69	26	176	14
BW7A	0	35	102	94	72
BW8A	0	12	29	12	17
BW9A	0	29	11	122	11
BX1A	0	37	98	181	83
C20D	0	0	367	255	61
C20D.0100	35	66	2,347	2,485	1,634
C20D.0101	24	18	118	331	61
C20D.0102	19	2	966	805	592
C20D.0103	0	6	114	296	85
C20D.0104	0	3	32	629	27
C20D.0105	0	8	100	986	86
C20D.0106	13	9	775	731	184
C20D.0107	0	33	717	699	203
C20D.0108	0	17	292	1,212	182
C21C	0	0	8	22	8
C21C.0001	0	15	71	281	12
C21C.0400	3	18	1,143	3,883	1,046
C21C.0401	27	31	453	1,353	282
C21C.0402	5	38	411	2,082	127
C21C.0403	0	8	242	332	224
C21C.0404	20	3	1,660	2,440	401
C21C.0405	0	0	77	640	1
C26C	0	0	5	2	0
C45D	0	0	206	278	39
C46B.2306	26	0	1,150	914	418
C49B	202	19	814	508	549
C49B.0001	64	0	1,090	246	1,016
C49B.1000	0	0	257	71	257
C49B.1100	0	161	1,636	1,483	1,476
C49B.1101	0	84	296	360	288
C49B.1102	0	62	487	1,138	283

Control Lake Project Area Soils by Watershed (acres)

<i>Watershed</i>	<i>Tonowek</i>	<i>McGilvery</i>	<i>Mineral</i>	<i>Organic</i>	<i>Till</i>
C49B.1200	0	0	843	277	831
C49B.1201	40	188	2,643	1,349	1,437
C49B.1202	0	123	575	498	455
C49B.2000	183	85	3,066	2,579	2,625
C49B.2001	7	0	896	428	889
C49B.2002	0	30	836	679	764
C49B.2003	0	0	222	136	138
C49B.2100	138	145	4,565	1,715	3,080
C49B.2101	0	94	901	519	462
C49B.2102	1	0	150	20	48
C49B.2103	2	2	350	74	61
C49B.2104	0	0	137	16	77
C49B.2105	0	0	347	142	220
C49B.2200	252	381	2,099	2,286	1,572
C49B.2201	0	259	329	811	256
C49B.2202	4	30	112	147	71
C49B.2203	8	43	163	247	67
C49B.2204	3	110	159	421	108
C49B.2205	8	76	600	458	275
C49B.2206	9	9	70	107	26
C49B.2207	0	15	330	396	146
C49B.2300	152	27	2,702	2,012	1,713
C49B.2301	0	35	453	234	415
C49B.2302	0	0	895	671	618
C49B.2303	0	0	204	319	77
C49B.2304	1	8	920	982	633
C49B.2305	15	4	748	578	416
C49B.2307	10	14	950	713	107
C49B.2308	29	16	1,058	733	603
C49B.2400	0	19	305	456	298
C49B.2401	0	30	580	611	296
C49B.2402	0	22	174	170	166
C49B.2403	0	1	248	190	247

Control Lake Project Area Soils by Watershed (acres)

<i>Watershed</i>	<i>Tonowek</i>	<i>McGilvery</i>	<i>Mineral</i>	<i>Organic</i>	<i>Till</i>
C49B.2404	0	28	106	393	93
C49B.2405	0	0	387	689	238
C49B.2406	11	60	329	446	143
C49B.2407	0	0	50	155	30
C49B.2408	0	6	89	63	53
C49B.2409	0	0	15	111	8
C49B.2500	54	26	1,457	1,259	356
C49B.2600	49	36	1,683	1,193	500
C49B.2700	4	0	2,024	735	2,020
C49B.2701	67	0	1,925	668	1,725
C70A	0	18	67	43	66
C72A	0	21	28	176	13
C73C	0	0	121	70	101
C74B	0	0	0	13	0
C93A	0	15	595	613	0
C95B.0000	0	7	12	25	0
C95B.1000	25	66	827	287	444
C95B.1100	18	26	173	48	134
C95B.1101	0	32	306	95	132
C95B.1200	88	35	1,331	514	774
C95B.1201	7	17	180	127	151
C95B.1203	32	0	871	397	586
C95B.2000	17	0	101	17	85
C95B.2001	9	0	118	28	71
C95B.2100	28	181	800	1,021	753
C95B.2101	0	120	308	457	260
C95B.2102	0	29	80	177	70
C95B.2103	0	59	171	940	155
C95B.2200	208	56	2,934	2,170	1,485
C95B.2201	10	13	33	142	4
C95B.2202	9	28	81	89	23
C95B.2203	2	0	329	164	326
C95B.2204	0	45	88	178	11
C95B.2205	0	0	592	431	18
C95B.2206	0	0	393	303	235
C95C.1202	0	0	254	45	93
C96A.0100	0	7	1,964	799	945
C96A.0101	0	0	315	137	100
C96A.0102	45	0	641	77	252
C97C	0	0	112	104	19
C99C	0	0	16	17	13
D01B	0	4	5	67	4
D03B.1100	0	1	153	90	93
D03B.1101	0	8	208	101	154
D03B.1102	0	0	971	148	261
D03B.1103	0	0	142	39	61
D03B.1200	0	54	181	435	100
D03B.1201	0	0	134	29	84

Control Lake Project Area Soils by Watershed (acres)

<i>Watershed</i>	<i>Tonowek</i>	<i>McGilvery</i>	<i>Mineral</i>	<i>Organic</i>	<i>Till</i>
D03B.1202	0	11	899	271	319
D03B.1300	0	0	1,715	1,526	603
D03B.1301	0	0	64	37	62
D04A	0	0	104	166	0
D07A	0	14	10	34	7
D08A.0100	66	200	1,374	1,615	1,239
D08A.0101	0	57	107	348	50
D08A.0102	0	15	195	249	180
D08A.0103	0	21	184	524	154
D08A.0104	0	0	49	322	49
D08A.0105	0	152	60	1,088	60
D08A.0106	0	78	108	432	108
D08A.0107	0	22	93	194	93
D08A.0108	0	0	271	419	271
D09A.0100	0	92	1,081	2,180	1,019
D09A.0101	0	41	99	465	58
D09A.0102	0	15	13	248	6
D10A	0	233	335	808	215
D11A	0	78	1	343	0
D12A.0001	0	110	148	959	27
D12A.0100	0	304	1,196	2,699	910
D12A.0101	0	82	38	403	31
D12A.0102	0	0	65	411	50
D13A	0	143	327	665	284
D14A	0	84	258	1,463	173
D15A	37	394	355	2,037	240
D16A	21	179	265	907	194
Total	2,131	6,975	81,323	87,738	50,868
Percent	0.9	3.0	35.5	38.3	22.2

Stream, Lake, and Estuarine Buffers for Use in Planning Timber Harvest Units in the Control Lake Project Area, Compared to Planning Level Riparian Management Area (RMA). Page 1 of 2

Channel Type (Riparian LUD)	Channel Type or Area Type (S&G LUD)	1/2 Avg. Stream Width (ft)	Stream or AHMU Class	No Commercial Harvest Buffer (ft)	No Programmed Harvest Buffer (ft)	Selective Harvest Buffer (ft)	Total Buffer (ft)	Planning Level RMA (ft)
HC6	A1	10	III	0	0	0	0	100+
HC3	A2	12	III	0	0	0	0	100+
AF2	A3	7	I,IIa	100*	0	0	100	100+
AF2	A3	7	IIb	0	25	35	60	100+
AF2	A3	7	III	0	25	0	25	100+
HC5	A4	7	III	0	0	0	0	100+
HC4	A5	9	III	0	0	0	0	100+
HC1	A6	7	III	0	0	0	0	100+
HC2	A7	9	III	0	0	0	0	100+
FP3	B1	10	I	100*	0	100	200	200+
MM1	B2	9	I,IIa	100*	0	0	100	100+
MM1	B2	9	IIb,III	0	0	25	25	100+
MM2	B3	23	I,IIa	100*	0	0	100	150+
MM2	B3	23	IIb	0	0	60	60	150+
MM2	B3	23	III	0	0	0	0	150+
MC1	B4	9	I,IIa	100*	0	50	150	150+
MC1	B4	9	IIb	0	0	150	150	150+
MC1	B4	9	III	0	0	0	0	150+
AF1	B5	11	I,IIa	100*	0	50	150	150+
AF1	B5	11	IIb	0	25	35	60	150+
AF1	B5	11	III	0	25	0	25	150+
MC2	B6	15	I,IIa	100*	0	0	100	100+
MC2	B6	15	IIb,III	0	0	0	0	100+
MC3	B7	16	I,IIa	100*	0	0	100	100+
MC3	B7	16	IIb,III	0	0	0	0	100+
ES8	B8	33	I	100*	0	100	200	200+
FP4	C1	25	I	100*	100	0	200	200+
LC1	C2	27	I,IIa	100*	0	0	100	100+
LC1	C2	27	IIb	0	25	0	25	100+
FP5	C3	54	I	100*	100	0	200	200+
FP1	C4	29	I	100*	100	0	200	200+
LC2	C5	30	I,IIa	100*	0	0	100	100+
LC2	C5	30	IIb	0	25	0	25	100+
FP2	C6	30	I	100*	100	0	200	200+
ES4	E1	40	I	100*	400	0	500	500+
ES3	E2	20	I	100*	100	0	200	200+
ES2	E3	17	I	100*	100	0	200	200+

Stream, Lake, and Estuarine Buffers for Use in Planning Timber Harvest Units in the Control Lake Project Area, Compared to Planning Level Riparian Management Area (RMA). Page 2 of 2

Channel Type (Riparian LUD)	Channel Type or Area Type (S&G LUD)	1/2 Avg. Stream Width (ft)	Stream or AHMU Class	No Commercial Harvest Buffer (ft)	No Programmed Harvest Buffer (ft)	Selective Harvest Buffer (ft)	Total Buffer (ft)	Planning Level RMA (ft)
ES1	E4	14	I	100*	0	0	100	100+
ES8	E5	33	I	100*	400	0	500	500+
L	L	n/a	I (all)	100	0	400	500	500+
L(> 50 ac)	L(> 50 ac)	n/a	IIa	100	0	400	500	500+
L(> 50 ac)	L(> 50 ac)	n/a	IIb	0	100	400	500	500+
L(< 50 ac)	L(< 50 ac)	n/a	IIa	100	0	0	100	100+
L(< 50 ac)	L(< 50 ac)	n/a	IIb	0	0	100	100	100+
L(< 5 ac)	L(< 5 ac)	n/a	IIa	100	0	0	100	100+
L(< 5 ac)	L(< 5 ac)	n/a	IIb,III	0	0	0	0	100+
PA1	L1	8	I,IIa	100*	0	0	100	100+
PA1	L1	8	IIb	0	100	0	100	100+
PA2	L2	30	I,IIa	100*	50	0	150	150+
PA2	L2	30	IIb	0	150	0	150	150+
PA5	L3	13	I,IIa	100*	0	0	100	100+
PA5	L3	13	IIb	0	100	0	100	100+
PA5	L3	13	III	0	0	0	0	100+
PA3	L4	20	I,IIa	100*	0	0	100	100+
PA3	L4	20	IIb	0	100	0	100	100+
PA3	L4	20	III	0	0	0	0	100+
PA4	L5	27	I,IIa	100*	0	0	100	100+
PA4	L5	27	IIb	0	100	0	100	100+
PA4	L5	27	III	0	0	0	0	100+
- -	Beach	n/a	n/a	0	500	0	500	n/a
- -	Estuary	n/a	n/a	0	1,000	0	1,000	n/a

¹ No commercial timber harvest allowed within this zone.

² No programmed commercial timber harvest allowed within this zone.

³ Only selective harvest methods or uneven-aged management are allowed within this zone.

IIa - denotes Class II streams that flow directly into Class I streams

IIb - denotes Class II streams that do not flow directly into Class I streams

* - minimum TTRA buffers; Note that the total buffer equals or exceeds the minimum TTRA buffer in all situations.

+ - To determine the total width of the riparian management area for analysis, add 1/2 average stream width to the planning level RMA, and multiply the result by two.

Buffers specified for all channel types are for one side of the channel. Buffer widths are measured as slope distance from the edge of streams and lakes, and as slope distance inland from mean high tide for beach fringe and estuaries. Actual buffers prescribed in the field may be wider than indicated, depending on site specific analysis. See Forest Service Management Prescriptions (Forest Service, 1991a), and BMPs (Forest Service, 1991b) for additional requirements.

Individual Stream and Watershed Descriptions

The following is a resource summary, by major watershed of available information for anadromous fish streams in the Project Area. Watershed numbers are those used in the main text of the EIS. Stream numbers are from the ADF&G stream catalog.

Information on lakes within the Project Area, which is extremely limited, is provided along with the descriptions of associated streams. Peak escapements reported are the highest number of fish counted on any single day during ADF&G spawning surveys, primarily between 1945 to 1993. It is important to note that pink escapements form the great majority of the ADF&G database; other species are incidentally counted. Also, many ADF&G catalogs are not updated with the most current data. As a result, the information used can be both outdated and limited when discussing species other than pink salmon.

The watersheds are discussed geographically grouped by areas. The descriptions will begin with the northeast side of the Project Area and work clockwise along the southeast and end up on the western side of the Project Area. All information for this section was primarily collected from the ADF&G Anadromous Stream Catalog of Southeastern Alaska and escapement database, ADF&G correspondence, and Forest Service correspondence.

Sweet Water Lake System

Log Jam Creek Watershed (C21C)

Log Jam Creek watershed is located in the north corner of the Project Area and flows north into the Sweetwater Lake system. It has 54,969 acres though only 15,353 acres are in the Project Area. It is a fourth order watershed with many small lakes. The watershed has had 10,925 acres harvested and is very accessible by roads.

Stream 106-30-53 (Log Jam Creek)

This creek has intensive sport harvest for both salmon and trout particularly because of road accessibility. Coho, sockeye, chum, and pink salmon, steelhead, rainbow and cutthroat trout and Dolly Varden char are all found in the creek.

The Honker Divide

The Honker Divide is made up of Thorne River System and Hatchery Creek. These two river systems, including the North Thorne River and the interconnected lakes, extend for approximately 42 miles.

The recreation opportunities of the Thorne-Hatchery River system are nationally recognized. The system is popular as a recreational fishery due to the large diversity of sport species available. It provides excellent fishing opportunities throughout most of the year. The Alaska Department of Fish and Game lists this system among the 19 "high quality" watersheds in Southeast Alaska for fisheries values. It is also rated as a Class 2 stream system in ADF&G's Forest Integrity Plan (Forest Service 1991a).

Hatchery Creek Watershed (Watershed C20D)

The watershed is approximately 19,247 acres with 14,683 of the acres in the Project Area. There are cabins located at Barnes Lake, Sweetwater Lake, and Lake Galea. Only Lake Galea is in the Project Area.

Stream 106-30-51 (Hatchery Creek)

Hatchery Creek is part of the Sweet Water Lake drainage. The creek flows north into Lake Bay and out to Whale Passage. Coho, sockeye, chum and pink salmon as well as cutthroat, rainbow, and steelhead trout and Dolly Varden char all are found in the river system. A fishway was proposed for this stream but has not been implemented. Recent peak documented escapements of anadromous fish were: 19,000 pink in 1986; 950 sockeye in 1986. Numbers of sockeye salmon in excess of 1,000 were documented in 1992 and 1993 subsistence harvest records.

Butterfly Lake

This lake is located on the northern boundary of the Project Area with only half of it in the Project Area. This lake is fed by one third order and one fourth order watershed which includes Lake Galea. Coho salmon, cutthroat and steelhead trout and Dolly Varden char are all found in the lake.

Lake Galea

This lake is located in the upper end of the watershed, draining north toward butterfly lake. It is a large lake that is fed by four third order watersheds, three second order watersheds and several single order watersheds. They all drain directly into the lake. Coho salmon, cutthroat and steelhead trout and Dolly Varden char are all found in the lake.

Thorne River Watershed (C49B)

Thorne River watershed is approximately 106,338 acres with 77,793 acres in the Project Area. Thorne River is the largest stream system on Prince of Wales Island. The river flows into Thorne Bay near the town of the same name. The mainstem and north fork of the Thorne River total about 30 miles in length, with an average stream width of 150 feet. There is direct access to the Thorne River at the lower end along the 30 Road, as well as on the North Thorne at the Honker Bridge and North Thorne Falls. The road runs east, away from the Thorne river, downstream from Rio Roberts. Logging has occurred along the lower end of the watershed. The FS 30 Road parallels the system for several miles from the mouth up to the Rio Beaver. Trapping cabins were established along the entire route, mineral exploration occurred during early years with logging developments in the 1950's. The Thorne River Watershed, because of its large size, will be described further by its sub-watersheds.

Stream 102-70-58 (Thorne River)

The Thorne River supports cutthroat and steelhead trout, Dolly Varden char and coho, sockeye, pink and chum salmon fisheries. Dead king salmon were found in the 1990 fish-kill. There is also anecdotal evidence of individuals catching king salmon in this system. The Thorne River is known for the largest steelhead run on Prince of Wales Island, averaging 650 adult fish annually (Freeman and Hoffman 1990) (Forest Service 1991a). Pink salmon have been documented in both 1986 and 1990 to have peak escapement numbers of 350,000. Enhancement efforts involving coho stocking have occurred in the Thorne River. The Klawock Lake Hatchery (operated by ADF&G Fisheries Rehabilitation, Enhancement, and Development Division [FRED]) served as the coho incubation and rearing facility for this system. The fish run size in the system has been poorly documented. The water is humic stained, causing a darkening of the water, making it difficult to survey. Thus run sizes, may be doing better than indicated

by surveys. Sockeye salmon observations during ADF&G pink salmon surveys have had small counts, with a maximum count of 200 fish in 1963; the last survey in 1982 counted 10 fish. However, the Forest Service has estimated the sockeye salmon run in the Thorne River to be 5,000 fish. This is a composite of runs in the main systems tributaries, especially those with the larger lakes, as discussed in the summaries below. This is a larger count than what is suggested by Halupka from the ADF&G surveys. Historic sockeye runs in the Thorne River were likely larger than the current estimate of 5,000 fish (Eric Johnston, 1/4/94 correspondence). Coho, also poorly documented, had a high count of 63 in the 1986 ADF&G pink salmon surveys (Halupka 1993). Forest harvest to stream bank occurred in the 1960s from Gravelly Creek down to the mouth of the Thorne River. Above Gravelly Creek the riparian area is relatively intact. The stream system is heavily fished by recreational and subsistence users due to its easy access and its large diversity of fish species.

Goose Creek Watershed (C49B.1000)

Goose Creek is a fifth order watershed located along the eastern border of the Project Area. It is made up of 13,726 acres with 1,184 acres found outside of the Project Area. It is the closest drainage to the town of Thorne Bay. The watershed has been heavily harvested and to the stream bank in many areas. The stream system has alluvial sections that are made up of highly productive substrate. Sockeye, coho, and pink salmon are all found in the system, as well as, cutthroat, steelhead/rainbow trout and Dolly Varden char. Twenty adult sockeye salmon were observed downstream from the 30 Road bridge at the mouth of Goose Creek in September 1993.

Angel Lake

Both the east fork (Foot Lake system) and the west fork (Rush Lake system), fourth order watersheds that feed into Angel Lake. Angel Lake is a moderately deep lake with maximum depth of 50 feet. No timber harvest has occurred around its banks leaving the riparian area intact. Angel Lake has coho, chum, pink and sockeye salmon, cutthroat, rainbow and steelhead trout and Dolly Varden char. In 1990 approximately 30 pairs of spawning sockeye were observed in the first 200 meters above Angel Lake. There is potential for a recreation trail along the lake for fishing access.

Foot Lake

This Lake, approximately half the size of Angel Lake, is located in the headwaters of a small tributary in the eastfork watershed. The outlet of the lake is relatively small making access by anadromous fish difficult. Little data exists on lake production though it is likely Dolly Varden char and/or cutthroat trout inhabit the lake.

Rush Lake

Rush Lake is located below Rush Peak on the west fork of the watershed. It is fed by a third order watershed. Salmon enter the west fork and probably utilize the lake although no documentation is available. There have been historical accounts of sockeye salmon in the system.

Rio Beaver (C49B.2100)

Rio Beaver is a fourth order watershed that flows directly into the Thorne River, from the west side above Goose Creek. The watershed has 8,979 acres, with all but 38 acres in the Project Area. Much of the watershed was logged in the 1960's. There is a high density of roads in the watershed with many culverts that require some repair and maintenance. The watershed is steep with many active landslides. To help stabilize some of these large landslides they were aerially seeded in 1992 and 1993. One large landslide that was not successfully rehabilitated by this method was scheduled for restoration in 1994. Despite human effects in the watershed the stream has large populations of cutthroat trout, pink and coho salmon and dolly varden char.

North Thorne River (C49B.2700)

The North Thorne River, a 24,281 acre watershed enters the Thorne River from the east side just above Rio Beaver. Most of the watershed, 16,783, acres is outside of the Project Area. The North Thorne is a fourth order watershed made up of two forks, the east and west forks. Extensive logging occurred on the east side of the watershed in the 1970's. Limited logging occurred at the lower end of the watershed. Coho, pink, chum, and sockeye are all found in the North Thorne. There is excellent spawning gravels from the confluence of the mainstem to above Snakey Lakes. Several pairs of adult spawning sockeye have been regularly observed at the 3016 Road crossing immediately upstream of Snakey Lakes and further upstream at the 3015 Road crossing

of the upper North Thorne. These fish are part of the sockeye run that use Snakey Lakes area for rearing. The west fork has a series of falls creating a partial barrier to anadromous fish documented by ADF&G stream catalogs, while no blockage occurs on the East Fork to prevent coho salmon from ascending to the headwaters. Coho salmon and Dolly Varden char both make it over the falls on the west fork.

Snakey Lakes

The Snakey Lakes are a system of lakes located in the east fork of the North Thorne River along the northeast Project Area boundary. The lake system is very shallow appearing to be more like extended glides or a series of oxbows with maximum depth of approximately five to ten feet deep. Sockeye salmon school in Snakey Lakes. In 1971, 139 rearing juvenile coho salmon were found in Snakey Lakes (Halupka 1993). Snakey Lakes also have documented populations of cutthroat and steelhead trout and Dolly Varden char.

Rio Roberts (C49B.2200)

Rio Roberts is a fourth order watershed flowing directly into the Thorne River from the west. The north part of this 8,758 acre watershed is being considered as a Resource Natural Area within the Tongass Land Management Plan revision process. It is one of the few watersheds of its size that has had very little timber harvesting. Currently the Thorne Bay Ranger District uses it as a baseline for comparison to other watersheds that have had harvesting to estimate their large woody debris targets. It also serve as an unofficial control area for watershed rehabilitation. The only road that enters the watershed is the 3010. The mainstem near the 3010 Road is bedrock contained and lacks spawning habitat. The lower mainstem down to the Thorne River is made up of wide flood plain channels. Above the 3010 Road a fish pass was built in 1988 allowing access to a highly productive gravel areas in the watershed. Coho salmon fingerlings were stocked above the fishpass for four consecutive years to establish runs in this formerly inaccessible area. Today, naturally produced coho are found above the fish pass. Other fish found in the system are pink salmon, steelhead and cutthroat trout, and Dolly Varden char.

Control Lake Creek (C49B.2000)

Control Lake Creek, a fifth order watershed has Control Lake Creek and two forks. The entire 20,100 acres of watershed is in the Project Area. The North Fork, known as Cutthroat Creek, includes Cutthroat Lake and Upper Cutthroat Lake. The South Fork is made up of Balls Lake, Control Lake and Control Lake Creek. Control Lake Creek flows into the Thorne River from the west side. This watershed contains coho, sockeye and pink salmon, steelhead, rainbow and cutthroat trout, and Dolly Varden char. Observations of 500-1,000 sockeye salmon are routinely sighted at the confluence of Cutthroat/Control and the Thorne River.

Balls Lake

Balls Lake is a 84 acre lake that receives drainage from Control Creek and several unnamed class I, II, and III streams along its north, northwest boundary. It is relatively shallow. The Control Creek/Ball's Lake system is known to support Dolly Varden, cutthroat trout, coho salmon, sockeye salmon and may potentially support steelhead and resident rainbow trout. Sockeye salmon are known to spawn above the lake. A boardwalk trail system was constructed on the lake for recreation use.

Control Lake

Control Lake is located above Balls Lake and is fed by four third-order watersheds. This lake contains coho, sockeye and pink salmon, steelhead, rainbow and cutthroat trout and Dolly Varden char. Control Lake has limited road access but is used for recreational purposes. In 1991, the Forest Service placed 23 trees in the lake to enhance fish cover.

Cutthroat Creek and Cutthroat Lakes

Cutthroat Creek is an excellent coho rearing stream with potential for heavy sockeye spawning and rearing in Cutthroat Lake. Approximately 100 sockeye were observed spawning in Cutthroat Lake inlet. Cutthroat and Upper Cutthroat Lakes are fed by two fourth order and one second order watershed. Dolly Varden, cutthroat, coho and possibly steelhead are found throughout the watershed, with all documented as present in Cutthroat Lake. Upper Cutthroat Lake has coho, Dolly Varden and steelhead trout. The eastern side of the watershed was harvested between 1989 and 1994. Buffers were left

in the riparian corridor protecting the stream channel. The road to the lake system is gated and has limited access to minimize fishing and hunting in the watershed.

Upper Thorne River Watershed (C49B.2300)

The Upper Thorne River watershed is approximately 16,800 acres with only 32 acres outside of the Project Area. It is a fourth order watershed that makes up the northern area of the Thorne River watershed. It includes three lakes, adjoining mainstream river and flows south where it merges with the Control Lake watershed. A half mile upstream from the confluence of Cutthroat Creek at a set of passable waterfalls, 100-400 sockeye salmon observations have been made in the pools below the falls.

Twin Lake

Twin Lake is located in the upper headwaters of the Thorne River watershed and is fed by one third order, one second order and five first order streams. Little information is known about this lake. Coho salmon, cutthroat and steelhead trout and Dolly Varden char are all found in the lake.

Upper Thorne Lake

This lake is located just downstream from Twin Lake. It is fed by twin lake and six third order- watersheds. Coho salmon, cutthroat and steelhead trout and Dolly Varden char are all found in this lake. The ADF&G catalog shows sockeye salmon above the falls into Thorne Lake, though no observations have been made by the Forest Service.

Lower Thorne Lake

The Upper Thorne Lake flows directly into this lake. The Lower Thorne Lake is a fairly deep productive lake. Two miles downstream there is a partial fish barrier that limits access to the lake. Sockeye and coho salmon pass the partial barrier. Chum and pink salmon are unable to pass the falls making this the upper limit for the searun stock in the Thorne River System. Cutthroat and steelhead trout and Dolly Varden char are also found in this lake. There is a Forest Service cabin on the lake but fishing pressure is low due to limited access.

Big Salt Lake

Big Salt Lake, a marine bay, is located on the south central boundary of the Project Area just north of Klawock. Most of Big Salt Lake is surrounded by private land. Eight watersheds flow into Big Salt Lake from the Project Area. Only the headwaters of these watersheds are on National Forest Service System Land. Six of the watersheds are identified by ADF&G numbers. Four of the six are located Forest Service System Land and are discussed below. Chinook salmon smolts from Deer Mountain Hatchery were transported to net pens and anchored at Big Salt, for imprinting and release. A total of 50,000 smolts were released in 1988 and 25,000 in 1991. The purpose of the project was to provide additional sport fishing for chinook in the Klawock area and the development of a terminal sport fishery in the Big Salt area. Low marine survival of these fish (less than 1 percent) caused the program to be discontinued.

Blackbear Creek Watershed (C93A)

This watershed is found at the head of Big Salt Lake. The creek drains from both Black Bear Lake and Black Lake. The watershed is a fourth order made up of 11,436 acres with only 1,208 acres in the Project Area. Of the land outside of the Project Area, 6,088 acres is located on state or private land. The Big Salt Road crosses the stream at the head of tidal influence and connects Craig and Klawock with areas to the north. There is an old cannery reported a short distance from the stream on Big Salt Lake.

Stream 103-60-31 (Black bear Creek)

Coho, pink, chum and sockeye salmon are all found in the drainage to Black Lake. Peak documented escapements of anadromous fish were: 350,000 pink in 1945; 10,000 chum in 1963; and 6,500 coho in 1944. There is excellent coho salmon rearing habitat throughout the stream below Blackbear Lake. The creek also supports Dolly Varden char, cutthroat, and steelhead trout.

Black Lake

Black Lake is the lower of the two lakes that are located in the Black Bear Creek watershed. The lake elevation is 65 feet above sea level. Coho, pink, chum and sockeye salmon, cutthroat and steelhead trout and Dolly Varden char are all found in the lake. The lake is fed by a fourth, third and second order watershed.

Black Bear Lake

Black Bear Lake is located at an elevation of 1,650 feet above sea level and has approximately four streams feeding into it. There is no access to the lake for anadromous or resident fish. However, in 1956 rainbow trout were stocked in the lake. Now a rainbow trout fishery is successfully established in the lake. Many people use a float plane to access the lake to fish for rainbow trout and to stay in Forest Service cabins on the lake. A hydroelectric development at Black Bear Lake has been built to supply electricity to Klawock and Craig.

Steelhead Creek Watershed (C95B)

Steelhead Creek watershed is 20,670 acres with almost 3,000 acres found outside of the Project Area. It enters the Big Salt Lake on the northeast side. Twelve percent is private land located near the mouth of the creek. This segment of the watershed has been heavily harvested up to the stream bank. In 1992, cottonwood and Sitka spruce were planted along the banks of Steelhead Creek in an effort to rehabilitate the riparian area.

Stream 103-60-29 (Steelhead Creek)

Most riparian area of lower Steelhead Creek, which is on private land, was harvested approximately ten years ago. The stream channel may have changed course to follow old skid roads that were located in the stream. Big Salt Lake Road, connecting Thorne Bay and Klawock, crosses the creek approximately 2 miles from the mouth. There is some old growth above the private land and below a forty foot fish barrier falls. The area above the falls has had moderate levels of timber harvest in and around the riparian area. Despite the affects of logging, there is good rearing in pools and spawning habitat throughout the watershed. Pink, chum, and coho salmon are all found in the watershed. Peak escapement was 350,000 pinks in 1945, 19,600 chum in 1948, and 650 coho in 1944. Significant numbers of steelhead, dolly varden and cutthroat trout are also supported here.

Election Creek Watershed (C96A)

Election Creek watershed is located in the center of the northern side of Big Salt Lake. The watershed is 6,285 acres in size with 2,345 acres found outside of the Project Area

of which 1,291 acres is on private land. The private land portion has experienced extensive timber harvest. The upper area of the watershed has a good alluvial system with high fish production

Stream 103-60-27 (Election Creek)

Most riparian area of Election Creek was harvested approximately ten years ago in the lower reaches. Instability, such as stream channelization and bank slumps has resulted. The stream was reportedly used as a catroad for a distance of approximately one mile. There were numerous stumps and logs 17 years ago in the stream during the stream habitat survey conducted by ADF&G. Pink, chum and coho salmon all have been recorded in the stream. Historic high escapement of 250,000 pinks was documented in 1945. 3,000 chum were documented in 1945. After 1962 no chum were observed. The escapement records indicated in 1954 there were no salmon escapements due to damage by logging. There is currently 634 acres harvested in the watershed on Project Area land. This does not include the 2,345 acres outside of the Project Area. Half of the land outside of the Project Area is privately owned and is heavily harvested.

Stream 103-60-25

This is a small watershed of 2,339 acres with only 270 acres found in the Project Area. The rest is located on private land. It is located on the northwest side of Big Salt Lake. It is considered unstable and is compounded by heavy logging in the lower section from the 1950s to the 1970s. During a 1977 ADF&G stream habitat survey, the stream was documented as "highly unstable with large spruce stumps isolated by flood channels; no regrowth of spruce on floodplain, only alder; stream is currently cutting a new channel through the brush." (ADF&G 1985). The area surveyed was not located on Forest Service land. The upper sections of the watershed are generally stable where there is bedrock and steep banks. Pink, chum, and coho salmon, as well as a limited sport fishery is found in the watershed.

Shinaku Inlet

Shinaku Inlet, a marine bay, is located west of Big Salt Lake. Wadleigh Island bounds the southern side of the inlet. Shinaku Inlet has estuarine habitat along parts of the shoreline where large watersheds drain containing significant populations of crabs and clams. Four watersheds located in the Project Area flow south into the inlet. There are

other watersheds located along the inlet but are not in the Project Area. As a result they are not listed below.

Shinaku Watershed (DO3B)

Shinaku Watershed is the largest of the watersheds on the Shinaku inlet at 16,590 acres. 3,718 acres are found outside the Project Area. The watershed length is approximately 19 miles. It is a fifth order watershed and has a large estuarine zone at the mouth.

Stream 103-60-13 (Shinaku Creek)

Shinaku Creek runoff comes from low forested land and large muskegs in the upper drainage. Both sides of the lower stream have been logged to the stream bank in the 1980's. This extensively harvested land is made up both private and National Forest Service System land. The stream reportedly changed course after the lower floodplain was used as a skid road. Historically logged areas in the drainage were documented as unstable during an ADF&G habitat survey (ADF&G 1985). Pink, chum and coho salmon as well as Dolly Varden, cutthroat, rainbow and steelhead trout are known to use the drainage. In the 1960's and 1970's arctic grayling was introduced to Shinaku Creek and Lake. In a habitat survey conducted in 1976 coho salmon rearing habitat was considered good. Extensive escapement records were kept from 1941-1977. In 1942, 18,000 chum and 3,000 coho were counted. However, in the late 1950's early 1960's chum counts has dropped to the low 1000s or less, and many years they were not seen. In 1945 peak pink salmon escapement was 800,000.

Shinaku Lake

Shinaku Lake is located in the upper headwaters of the Project Area. This is one of only three lakes stocked with arctic grayling on Prince of Wales Island. The lake was stocked in the 1960's and 1970's. Cutthroat and rainbow trout and Dolly Varden char are probably supported in the lake as well. Anadromous fish do not have access to the lake. Based on the GIS layer, a Class III stream drains the lake. The lake is fed by one third order, two second order, and seven first order streams.

Unnamed Watershed (BT4A)

This third order watershed is located on the north shore of Shinaku Inlet, 0.6 miles west of Shinaku Creek. It is a small watershed, approximately 802 acres in size with almost 600 acres outside of the Project Area on private land.

Stream 103-60-11

Pinks, chum, and coho salmon use this unnamed drainage. The watershed length is approximately 1.8 miles long. No other documentation exists on this stream.

Unnamed Watershed (DO7A)

This small watershed is a total of 1,797 acres with only 669 acres found in the Project Area. It is a third order watershed. There are beaver ponds located throughout the drainage.

Stream 103-60-07

Pink, chum, and coho salmon use the stream. 17,000 pink salmon were documented in 1977, though records are incomplete. The best spawning habitat is in the first 900 feet of the stream. There is good coho rearing habitat throughout the drainage which is evident by the large number of coho salmon fry observed during the survey in 1977. No timber harvest has occurred in this drainage.

Unnamed Watershed (DO8A)

This unnamed watershed is the eastern most watershed on Shinaku Inlet. It is the second largest watershed, approximately 8,400 acres, on the inlet with all but 285 acres in the Project Area. It is a fourth order watershed. Large shallow mud flats at the mouth of the watershed support a large clam population.

Stream 103-60-05

Coho, pink and chum salmon have been observed in the stream. The area has good rearing habitat but not much spawning habitat. No timber harvest has occurred in this watershed.

San Christoval Channel

San Christoval Channel runs between the southwestern boundary of the Project Area and San Fernando Island. This is a rocky coastline with some sandy coves. Both Sombrero Island and Rosario Island are found along the Project Area coast in the channel. The channel ends just south of the Blanquizar Island. Four watersheds recognized by ADF&G enter this area and are listed below. Approximately five small first or second order watersheds having no documented information flow into San Christoval Channel.

Unnamed Watershed (BT6A)

This is an unnamed watershed that is located 1.2 miles north of Sombrero Island in Picnic Bay. The watershed length is approximately 0.9 miles with two stream forks making it a second order watershed. It is approximately 146 acres, all on National Forest Service System Land. No logging or other impacts have occurred to the watershed.

Stream 103-60-03

Coho and pink salmon utilize this stream. The stream has excellent rearing habitat throughout. A peak escapement of 10,800 pink salmon were documented in the drainage in 1975.

11 Mile Creek Watershed (DO9A)

The 11 Mile Creek is a fourth order watershed of 4,104 acres. The entire watershed is in the Project Area. Two small class I lakes are located within the watershed. No timber harvest has occurred in the watershed.

Stream 103-70-11 (11 Mile Creek)

Pinks, chum and coho salmon all utilize this stream. In the early 1940's as many as 100,000 pink and 20,000 chum were documented at peak escapement. In the late 1970's pink salmon escapement numbers only reached in the low 1000s and chum were not documented. Presently pink salmon escapement numbers are fluctuating between the tens of thousands and thousands while chum have not been noted.

Goodrow Creek Watershed (D10A)

Goodrow Creek, a third order watershed, has a drainage area of 1,062 acres all on National Forest Service System Land.

Stream 103-70-08 (Goodrow Creek)

This is a small stream that has chum, pink, and coho salmon. Peak escapement for pinks was 70,000 in 1986 and for chum was 3,000 in 1959. Chum have not been observed since 1972.

James Creek Watershed (D16A)

James Creek is a 1,178 acre, third order watershed, 0.8 miles southeast of Blanquizal Point. No harvest has occurred in this watershed, which is all National Forest Service System land.

Stream 103-70-05 (James Creek)

Coho fry and pink salmon have been documented in the escapement records. As many as 70,000 pink salmon were counted in 1986. Chum salmon have been sited infrequently. The last siting was in 1985, when only six were seen. It is probable that trout and char are also present in the creek.

St. Philip Island

St. Philip Island is located off the western most coastline of the Project Area. Four watersheds recognized by ADF&G flow into salt water along this coastline. Part of this coastline is designated as a semi-primitive recreation area.

Unnamed Watershed (BW1A)

This is a small third order watershed of 599 acres located on the western side of the Project Area 0.5 mile Northeast of Blanquizal point.

Stream 103-70-003

Coho, pinks, and chum salmon all are found in the drainage. Escapement of 16,000 pink in 1986 and 500 chum salmon were documented in 1977. Spawning surveys have not been collected on an annual basis.

Unnamed Watershed (BW2A)

This small watershed of 419 acres is located directly inside St. Philip Island. It is only a second order watershed but, is recognized by ADF&G and is all on National Forest Service System land.

Stream 103-80-56

This is primarily a pink salmon system with excellent spawning habitat. There is also rearing coho habitat. Due to the small size of the stream there is low trout or resident char potential. 15,000 pink salmon were counted in 1983. 1982 was the most recent siting of chum salmon in the drainage with a count of 33.

Unnamed Watershed (BW3A)

This is a small first order watershed of 217 acres. The entire watershed is densely covered by forest canopy making spawning surveys difficult.

Stream 103-80-53

There is very little available escapement data for the watershed. However, as many as 22,000 pink salmon were documented in 1983. The only documentation of chum salmon was in 1982 with only 2 counted. There is sparse coho use observed. Overall the rearing and spawning habitat in the drainage is poor.

Unnamed Watershed (D15A)

This third order watershed is approximately 2,423 acres in area. It is located just south of Salt Lake Bay. A small estuary is located at the mouth of the watershed.

Stream 103-80-50

Pinks, chum, and coho salmon are all found in the drainage. Rearing habitat for coho salmon is fair. There are high historic escapements for pinks and chum salmon; 67,500 pinks in 1945 and 15,000 chum in 1944. The most recent high escapements of pink salmon occurred in 1986 with 45,000 and in 1984 and 1990 with 40,000 counted. 215 chum salmon were counted in 1983 but very little other documentation of chum salmon escapement exists.

Salt Lake Bay

Salt Lake Bay is located on the western side of the Project Area with most of it located in a designated Semi-primitive Recreation Area. Six watersheds are located inside the bay. Three watersheds are identified by ADF&G and are described below.

Unnamed Watershed (D14A)

This watershed is located at the head of Salt Lake Bay on the south side and drains a 1,809 acre area. It is a fourth order watershed. There are a few small lakes at the headwaters of the watershed.

Stream 103-80-46

Pinks, chum and coho salmon are all found in this stream. As many as 112,000 pinks and 16,000 chum were counted in the 1940's. Chum numbers have dropped off dramatically since the early 1950's. Though, in 1986 chum escapement was counted at 4,754.

Unnamed Watershed (D13A)

This small third order watershed of 995 acres is found at the head of the Salt Lake Bay.

Stream 103-80-44

Little is known about this stream except that it supports pink, chum and coho salmon.

Unnamed Watershed (BW5A)

This third order watershed of 489 acres is located at the north head of Salt Lake Bay. The stream flows through 1,500 feet of grass flats near the mouth of the creek forming a small estuary. The estuary is unstable but upstream in the forested segment of the watershed the system becomes stabilized.

Stream 103-80-42

Escapement data show good pink returns with minute chum counts in the past. In 1983 53,000 pink were counted in this small watershed. Coho salmon fry have been observed in good rearing pools.

Nossuk Bay

Nossuk Bay is located in the northwest corner of the Project Area just southeast of Heceta Island. There are twelve watersheds, mostly first and second order draining into the bay. Four watersheds are recognized by ADF&G and described below.

Unnamed Watershed (BX1A)

This is a small first order watershed made up of 299 acres located on the south shore of Nossuk Bay.

Stream 103-80-40

The stream origin is a small lake blocked by a beaver dam. Pink salmon is the primary species that utilizes the drainage, though there are rearing coho present. Cutthroat trout are probably found in the lake. There may also be chum salmon found in the system.

Unnamed Watershed (BT2A)

This third order watershed of 459 acres flows into a small estuary in Nossuk bay. A small amount of the watershed was harvested in 1994.

Stream 103-80-37

There is no available fisheries information on this stream but it may support pink salmon.

Unnamed Watershed (D12A.0001)

This fourth order watershed of 1,107 acres is located in the north head of Nossuk Bay. There will be some harvesting of the watershed in 1994 making up 77 acres including TTRA stream buffers.

Stream 103-80-36

Pink, chum and coho salmon are found in the stream. There is excellent rearing habitat, which coho fry use extensively. There is also potential cutthroat fishery. A few beaver dams are acting as fish barriers to chum and pink salmon but not coho. The watershed is presently in a natural state with very little human induced change.

Nossuk Creek Watershed (D12A.0100)

Nossuk Creek watershed is located at the north head of Nossuk bay. The drainage area is approximately 4,973 acres with 399 acres harvested cut, with future cuts scheduled in 1994.

Stream 103-80-35 (Nossuk Creek)

This is primarily a pink salmon system with significant numbers of chum and coho present. Probably a small steelhead population exists as well. As many as 103,000 pinks were documented in 1945 and 12,000 chum in 1942. Chum salmon have only been observed intermittently since the early 1960's. The majority of the Nossuk Creek riparian area is in an old growth state.

	ROAD EROSION HAZARD BY SUBWATERSHED			
SUBWATERSHED				
	Alt. 2	Alt. 7	Alt. 8	Alt. 9
BW1A	37	0	0	0
BT2A	2	0	2	2
C20D	130	17	17	17
C20D.0100	578	578	54	34
C20D.0101	51	51	0	0
C20D.0102	639	639	72	72
C20D.0103	68	5	0	0
C20D.0104	17	1	0	0
C20D.0105	2	2	0	0
C20D.0106	5	5	0	0
C20D.0107	26	10	26	26
C20D.0108	19	2	0	0
C21C	2	2	0	0
C21C.0001	68	0	0	0
C21C.0400	523	523	523	523
C21C.0401	521	520	520	520
C21C.0402	416	269	339	264
C21C.0403	3	3	3	1
C21C.0404	315	284	284	284
C21C.0405	966	966	966	966
C49B	1096	1096	1096	1096
C49B.0001	780	780	780	780
C49B.1000	130	130	130	130
C49B.1100	122	122	122	122
C49B.1102	12	5	5	5
C49B.1200	147	0	0	0
C49B.1202	294	164	164	164
C49B.2000	333	333	283	278
C49B.2002	11	11	0	0
C49B.2003	11	11	0	0
C49B.2100	3144	2495	2495	2495
C49B.2101	130	1	1	1
C49B.2102	1	1	1	1
C49B.2103	9	9	9	9
C49B.2104	260	9	9	9
C49B.2105	4	4	4	4
C49B.2200	527	522	528	520
C49B.2201	134	130	132	132
C49B.2202	34	0	17	0
C49B.2203	18	0	17	0
C49B.2204	4	0	0	0
C49B.2205	90	2	43	7
C49B.2206	5	0	4	0
C49B.2300	38	5	0	0
C49B.2301	1	1	0	0
C49B.2302	652	652	650	650

	ROAD EROSION HAZARD BY SUBWATERSHED			
SUBWATERSHED				
	Alt. 2	Alt. 7	Alt. 8	Alt. 9
C49B.2303	4	3	0	0
C49B.2304	1	1	0	0
C49B.2305	651	651	651	651
C49B.2306	288	288	272	288
C49B.2307	17	0	0	1
C49B.2308	144	130	8	8
C49B.2400	521	521	521	520
C49B.2401	659	659	659	0
C49B.2402	390	390	390	390
C49B.2403	780	780	780	0
C49B.2404	68	0	68	0
C49B.2405	132	132	132	130
C49B.2406	6	0	6	0
C49B.2407	269	263	269	263
C49B.2600	698	684	684	0
C49B.2701	784	784	780	780
C70A	650	650	650	650
C72A	1	1	1	0
C93A	3	3	3	0
C95B.0000	20	20	20	17
C95B.1000	85	68	68	68
C95B.1100	2	2	2	2
C95B.1101	1	1	1	1
C95B.1200	17	17	17	17
C95B.1202	7	18	18	18
C95B.1203	11	1	1	1
C95B.2000	260	17	17	17
C95B.2100	925	405	405	405
C95B.2101	263	133	133	132
C95B.2102	130	130	130	130
C95B.2200	356	318	317	315
C95B.2201	6	6	6	6
C95B.2202	4	4	4	0
C95B.2203	45	45	45	45
C95B.2204	2	1	1	0
C95B.2205	55	55	55	51
C95B.2206	2	2	2	2
C96A.0100	26	24	24	24
C99C	51	51	51	51
D03B.1100	68	68	68	68
D03B.1101	85	85	85	85
D03B.1102	164	163	164	164
D03B.1200	1	1	1	1
D03B.1202	9	8	8	8
D03B.1300	323	289	323	323
D03B.1301	3	3	3	3

	ROAD EROSION HAZARD BY SUBWATERSHED			
SUBWATERSHED				
	Alt. 2	Alt. 7	Alt. 8	Alt. 9
D04A	54	54	54	54
D05A	20	20	20	20
D06A	37	37	37	37
D07A	0	3	3	3
D08A.0100	227	0	130	130
D08A.0101	35	0	0	0
D08A.0102	687	0	654	654
D08A.0103	4	0	2	3
D08A.0104	520	0	260	260
D08A.0107	28	0	28	28
D08A.0108	19	0	4	4
D09A.0100	522	0	0	0
D09A.0101	102	0	0	0
D09A.0102	390	0	0	0
D12A.0001	13	0	13	13
D12A.0100	2472	0	2210	2210
D12A.0102	650	0	262	262
D13A	3	0	0	0
D14A	6	0	0	0
D15A	752	0	0	0
D16A	2	0	0	0
TOTAL	27775	18349	20816	18425

Appendix E

Road Management Objectives

Traffic Service Levels

The U.S. Forest Service operates an extensive road system throughout the United States. The agency developed a concept describing significant traffic characteristics and operating conditions. These "traffic service levels" are used in setting maintenance levels throughout the National Forest System.

	A	B	C	D
Flow	Free flowing with adequate passing facilities.	Congested during heavy traffic such as during peak logging or recreation activities.	Interrupted by limited passing facilities or slowed by the road condition.	Flow is slow or may be blocked by an activity. Two-way traffic is difficult and may require backing to.
Volumes	Uncontrolled: will accommodate the expected traffic volumes.	Occasionally controlled during heavy use periods.	Erratic: frequently controlled as the capacity is reached.	Intermittent and usually controlled. Volume is limited to that associated with the single purpose.
Vehicle Types	Mixed: includes the critical vehicle and all vehicles normally found on public roads.	Mixed: includes the critical vehicle and all vehicles normally found on public roads.	Controlled mix: accommodates all vehicle types including the critical vehicle. Some use may be controlled to minimize conflicts between vehicle types.	Single Use: not designed for mixed traffic. Some vehicles may not be able to negotiate. Concurrent uses between commercial and other traffic is restricted.
Critical Vehicle	Clearances are adequate to allow free travel. Overload permits are required.	Traffic controls needed where clearances are marginal. Overload	Special provisions may be needed. Some vehicles will have difficulty negotiating.	Some vehicles may not be able to negotiate. Loads may have to be off-loaded and walked in.
Safety	Safety features are a part of the design.	High priority in design. Some protection is accomplished by	Most protection is provided by traffic management.	The need for protection is minimized by low speeds and strict traffic controls.
Management Traffic	Normally limited to regulatory, warning, and guide signs and permits.	Employed to reduce traffic volume and conflicts.	Traffic controls are frequently needed during periods of high use by the dominant	Used to discourage or prohibit traffic other than that associated with the single purposes.
User Costs	Minimize: transportation efficiency is important.	Generally higher than "A" because of slower speeds and increased delays.	Not important: efficiency of travel may be traded for lower construction costs.	Not considered.
Alignment	Design speed is the predominant factor within feasible topographic limitations.	Influenced more strongly by topography than by speed and efficiency.	Generally dictated by topographic features and environmental factors. Design speeds are generally low.	Dictated by topography environmental factors, and the design and critical vehicle limitations. Speed is not important.
Road Surface	Stable and smooth with little or no dust, considering the normal season of use.	Stable for the predominant traffic for the normal use season. Periodic dust control for heavy use or environmental reasons. Smoothness is commensurate with the design speed.	May not be stable under all traffic or weather conditions during the normal use season. Surface rutting, roughness, and dust may be present, but controlled for environmental or investment protections.	Rough and irregular. Travel with low clearance vehicles is difficult. Stable during dry conditions. Rutting and dusting controlled only for soil and water protection.

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VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class		Traffic Serv Level	Road Main, Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA	V-Notch		Other Strm' xings	Unstab Solls miles	Switch backs no.
			T	R	S	from	to		type	haul								const	road const. \$	road reconst. \$					>48" CMP bridges \$	total \$	xing			
Big Set - Thorne Bay LTF	595	424	B	82	20	1915	1916	0.16	L	5	E	D	1	0.33	0.00	0.33	24,000	0	0	24,000								4		
	595	424	B	70	82	1916	1917	0.41	L	5	E	D	1	0.84	0.00	0.84	61,500	0	0	61,500								4		
	595	423	B	70	82	1917	1918	0.21	L	5	E	D	1	0.43	0.00	0.43	31,500	0	4,700	36,200				1			4			
	595	423	B	70	82	1918	1922	0.72	L	6	E	D	1	1.78	0.00	1.78	108,000	0	0	108,000	0.68						4			
	595	433	B	70	82	20.1	1919	1920	0.17	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	25,500							2		
	595	433	B	70	82	20.1	1920	1928	0.05	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	7,500							2		
	595	422	B	70	82	20.1	1921	1922	0.42	L	5	E	D	1	0.86	0.00	0.86	63,000	0	14,100	77,100				3	2		2		
	595	420	B	70	82	20	1922	1923	0.15	L	5	E	D	1	0.31	0.00	0.31	22,500	0	4,700	27,200				1		1	M		
	595	420	B	70	82	20	1923	1924	0.27	L	5	E	D	1	0.55	0.00	0.55	40,500	0	0	40,500				1		1	M		
	595	420	B	70	82	20	1924	1925	0.05	L	5	E	D	1	0.10	0.00	0.10	7,500	0	4,700	12,200				1			4		
	595	420	B	70	82	20	1925	1926	0.14	L	5	E	D	1	0.29	0.00	0.29	21,000	0	4,700	25,700				1			4		
	595	420	B	70	82	20	1926	1912	0.56	L	5	E	D	1	1.14	0.00	1.14	84,000	0	50,000	134,000			1		1		3		
	595	433	B	70	82	20.1	1928	1929	0.1	L	4	E	D	1	0.30	0.00	0.30	15,000	0	0	15,000	0.1						2		
	595	433	B	70	82	20.1	1929	1921	0.58	L	5	E	D	1	1.18	0.00	1.18	87,000	0	54,700	141,700			1	1			2		
	595	431	B	72	82	19.5	1931	1932	0.15	L	5	E	D	1	0.31	0.00	0.31	22,500	0	4,700	27,200				1			2		
	595	431	B	72	82	19.5	1932	1933	0.09	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	13,500							2		
	595	431	B	72	82	19.5	1934	1935	0.12	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	18,000							1		
	595	431	B	72	82	19.5	1935	1939	1.36	L	6	E	D	1	3.36	0.00	3.36	204,000	0	4,700	208,700	0.03		1		1	M	16		4
	595	431	B	72	82	18.1	1939	1905	1.05	L	5	E	D	1	2.14	0.00	2.14	157,500	0	0	157,500	0.05						4		
	595	421	B	72	82	21	1941	1942	0.09	L	6	E	D	1	0.22	0.00	0.22	13,500	0	0	13,500	0.09						1		
	595	421	B	72	82	21	1942	1943	0.06	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	9,000							1		
	595	421	B	72	82	21	1943	1944	0.24	L	6	E	D	1	0.59	0.00	0.59	36,000	0	4,700	40,700			1				3		
	595	420	B	72	82	21	1944	1945	0.06	L	6	E	D	1	0.15	0.00	0.15	9,000	0	0	9,000							7		
	595	420	B	72	82	21	1945	1913	0.39	L	5	E	D	1	0.80	0.00	0.80	58,500	0	4,700	63,200			1	1					
	594	405	B	71	81	36.F	1950	1954	0.14	L	5	E	D	1	0.29	0.00	0.29	21,000	0	0	21,000									
	594	405	B	71	81	36.F	1951	1953	0.12	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	18,000									
	594	405	B	71	81	36	1952	1953	0.02	L	5	E	D	1	0.04	0.00	0.04	3,000	0	0	3,000									
	594	405	B	71	81	36	1953	1954	0.13	L	5	E	D	1	0.27	0.00	0.27	19,500	0	0	19,500									
	594	405	B	71	81	36	1954	1955	0.8	L	5	E	D	1	1.63	0.00	1.63	120,000	0	0	120,000	0.7								
	595	434	B	71	81	34.3	1956	1955	0.75	L	6	E	D	1	1.85	0.00	1.85	112,500	0	0	112,500									
	595	412	B	71	81	36	1958	1962	0.03	C	2	E	C	2	0.05	0.00	0.05	4,500	0	0	4,500									
	595	412	B	71	81	35.1	1961	1962	0.19	L	5	E	C	2	0.39	0.00	0.39	28,500	0	0	28,500									
595	406	B	71	81	36	1963	1966	0.05	C	2	E	C	2	0.09	0.00	0.09	7,500	0	0	7,500								1		
595	406	B	71	81	36B	1964	1963	0.06	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	9,000										
595	406	B	71	81	36A	1965	1966	0.05	L	5	E	C	2	0.46	0.00	0.46	40,500	0	0	40,500								5		1
595	406	B	71	81	36	1966	1967	0.27	C	2	E	C	2	0.78	0.00	0.78	57,000	0	0	57,000	0.18									
595	407	B	71	82	6.1	1968	19	0.38	C	5	E	C	2	0.44	0.00	0.44	27,000	0	0	27,000	0.18									
595	407	B	71	82	6.1C	1969	1971	0.18	L	6	E	D	1	0.77	0.00	0.77	67,500	0	0	67,500										
595	413	B	71	82	6.1	1971	1972	0.45	C	2	E	C	2	0.09	0.00	0.09	7,500	0	0	7,500								4		
595	413	B	71	82	6.1	1972	1974	0.05	C	2	E	C	2	0.04	0.00	0.04	3,000	0	0	3,000										
595	413	B	71	82	6.1B	1973	1972	0.02	L	5	E	D	1	0.10	0.00	0.10	9,000	0	0	9,000										
595	413	B	71	82	6.1	1974	1976	0.06	C	2	E	C	2	0.18	0.00	0.18	13,500	0	0	13,500										
595	413	B	71	82	6.1A	1975	1974	0.09	L	5	E	D	1	0.69	0.00	0.69	51,000	0	0	51,000	0.06									
595	413	B	71	82	6.1	1976	1968	0.34	C	5	E	C	2	0.04	0.00	0.04	3,000	0	0	3,000	0.27									
595	413	B	71	82	6.1	1977	1976	0.02	L	5	E	D	1	0.15	0.00	0.15	9,000	0	0	9,000										
595	409	B	71	82	31.1	1978	1979	0.09	L	5	E	D	1	1.78	0.00	1.78	108,000	0	0	108,000	0.27									
595	409	B	71	82	31.1	1979	1980	0.06	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	13,500										
595	409	B	71	82	31.1	1980	1981	0.72	L	6	E	D	1	0.22	0.00	0.22	16,500	0	0	16,500										
595	408	B	71	82	31.1	1981	1982	0.09	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	7,500										
595	414	B	71	82	31	1984	1986	0.11	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	7,500										
595	414	B	71	82	31B	1985	1986	0.05	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	7,500										

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Traffic Serv Level	Road Main Level	Access Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variable \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing	#	diff	Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from	to										road const.	road reconst.	>48" CMP and bridges	total \$											
595	414	B	71	82	31	1986	1988	L	5	E	1	A	1	0.20	0.00	0.20	15,000	0	0	15,000											
595	414	B	71	82	31A	1987	1988	L	5	E	1	A	1	0.10	0.00	0.10	7,500	0	0	7,500											
595	414	B	71	82	31	1988	1983	L	5	E	1	A	1	0.35	0.00	0.35	25,500	0	0	25,500	0.03								3		
595	416	B	72	82	8	1990	1991	L	5	E	1	A	1	0.39	0.00	0.39	28,500	0	0	28,500											
595	416	B	72	82	8	1991	1910	L	5	E	1	A	1	1.59	0.00	1.59	117,000	0	0	117,000	0.05							3	E		8
595	418	B	72	82	7.2	1993	1994	L	6	E	1	A	1	0.20	0.00	0.20	12,000	0	0	12,000	0.08							1		1	
595	418	B	72	82	7.2	1994	1995	L	6	E	1	A	1	0.17	0.00	0.17	10,500	0	0	10,500	0.04							1		1	
595	418	B	72	82	7.2	1995	1903	L	5	E	1	A	1	0.49	0.00	0.49	36,000	0	0	36,000								2		2	
595	403	B	71	84	24	2106	2107	L	5	E	1	P	1	1.65	0.00	1.65	121,500	0	9,400	130,900	0.03		2					4		4	
594	416	B	71	80	24.1	2207	2207	L	5	E	1	P	1	0.33	0.00	0.33	24,000	0	0	24,000								1		1	
595	411	B	71	81	36	1955	1957	C	3	M	2	P	2	0.94	0.00	0.94	86,000	0	4,700	90,700	0.08		1				1	E	5		
595	412	B	71	81	36	1957	1958	C	2	M	2	P	2	1.98	0.00	1.98	232,000	0	9,400	241,400	0.34		2				2	M	10		
595	412	B	71	81	35.2	1959	1960	L	4	M	2	P	2	0.21	0.00	0.21	14,000	0	0	14,000											
595	412	B	71	81	35.2	1960	1958	L	4	M	2	P	2	0.43	0.00	0.43	28,000	0	0	28,000	0.19							1		1	
595	412	B	71	81	36	1962	1964	C	3	M	2	P	2	0.70	0.00	0.70	64,000	0	0	64,000								1		1	
595	412	B	71	81	36	1964	1963	C	3	M	2	P	2	0.61	0.00	0.61	56,000	0	0	56,000								10		10	
595	407	B	71	81	36	1967	1968	C	1	M	2	P	2	3.16	0.00	3.16	230,000	0	50,000	280,000	0.08		1								
595	407	B	71	82	6.1	1970	1971	L	5	M	1	A	2	0.18	0.00	0.18	18,000	0	0	18,000											
595	408	B	71	82	31.1	1982	1983	L	5	M	1	A	2	1.69	0.00	1.69	166,000	0	0	166,000	0.02										
595	414	B	71	82	31	1983	1908	C	3	M	2	A	2	0.70	0.00	0.70	64,000	0	0	64,000								2		2	
595	415	B	72	82	6A	1992	1906	L	6	M	2	A	2	0.22	0.00	0.22	18,000	0	0	18,000	0.09										
595	405	B	71	84	24	2100	2101	L	5	M	2	P	2	0.29	0.00	0.29	28,000	0	0	28,000								3		3	
595	405	B	71	84	24	2101	2102	L	5	M	2	P	2	0.73	0.00	0.73	72,000	0	0	72,000								3		3	
595	405	B	71	84	24	2102	2103	L	5	M	2	P	2	0.10	0.00	0.10	10,000	0	0	10,000								3		3	
595	403	B	71	84	24	2103	2104	L	5	M	2	P	2	0.08	0.00	0.08	8,000	0	4,700	12,700			1				1	M			
595	403	B	71	84	24	2104	2105	L	5	M	2	P	2	0.14	0.00	0.14	14,000	0	0	14,000								3		3	
595	403	B	71	84	24	2105	2106	L	5	M	2	P	2	0.14	0.00	0.14	14,000	0	0	14,000								3		3	
594	416	B	71	80	24.1	2207	2208	L	4	M	2	P	2	3.59	0.00	3.59	236,000	0	0	236,000	0.14							8		8	
594	409	B	71	80	24.1	2208	2209	L	4	M	2	P	2	2.58	0.00	2.58	170,000	0	0	170,000	0.68							10		10	
594	416	B	71	80	24.1	2208	2208	L	4	M	2	P	2	1.09	0.00	1.09	72,000	0	0	72,000	0.5							4		4	
594	401	B	71	80	24.1	2209	2209	L	4	M	2	P	2	1.28	0.00	1.28	84,000	0	0	84,000								4		4	
594	410	B	71	80	24.1	2209	2209	L	4	M	2	P	2	1.22	0.00	1.22	80,000	0	0	80,000								4		4	
594	410	B	71	81	26	2210	2211	L	5	M	2	P	2	1.18	0.00	1.18	116,000	0	0	116,000	0.16							15		15	
594	417	B	71	81	26	2212	2213	L	5	M	2	P	2	0.22	0.00	0.22	22,000	0	0	22,000	0.2							1		1	
594	417	B	71	81	26	2213	2213	L	5	M	2	P	2	0.47	0.00	0.47	46,000	0	0	46,000								3		3	
594	417	B	71	81	26	2213	2213	L	5	M	2	P	2	0.22	0.00	0.22	22,000	0	0	22,000								1		1	
594	417	B	71	81	26	2213	2214	L	5	M	2	P	2	0.49	0.00	0.49	48,000	0	0	48,000								3		3	
594	417	B	71	81	26	2214	2215	L	6	M	2	P	2	0.72	0.00	0.72	58,000	0	0	58,000	0.15							2		2	
594	415	B	71	81	7.1C	2215	2217	L	6	M	2	P	2	0.54	0.00	0.54	44,000	0	0	44,000	0.14							1		1	
595	431	B	71	81	7.1C	2217	2218	L	6	M	2	P	2	1.16	0.00	1.16	94,000	0	0	94,000								4		4	
595	431	B	72	82	19.5	1930	1931	L	5	D	3	A	3	0.27	0.00	0.27	39,000	0	0	39,000	0.13							2		2	
595	431	B	72	82	19.5	1933	1934	L	5	D	3	A	3	0.22	0.00	0.22	33,000	0	0	33,000	0.11							2		2	
594	410	B	71	81	7.1C	2209	2216	L	6	D	1	P	3	2.84	0.00	2.84	345,000	0	59,400	404,400	0.12		2				D	17		17	
594	410	B	71	81	26	2211	2212	L	4	D	1	P	3	1.19	0.00	1.19	117,000	0	0	117,000	0.35							2		2	
594	407	B	71	81	7.1C	2216	2216	L	6	D	1	P	3	0.22	0.00	0.22	27,000	0	0	27,000	0.74							3		3	
594	407	B	71	81	7.1C	2216	2215	L	6	D	1	P	3	1.93	0.00	1.93	234,000	0	0	234,000								10		10	
594	415	B	72	81	1	2218	2218	L	4	D	1	P	3	0.79	0.00	0.79	78,000	0	0	78,000	0.09							4		4	
594	415	B	72	81	1	2218	2219	L	4	D	1	P	3	1.67	0.00	1.67	165,000	0	0	165,000			1					10		10	
594	415	B	72	81	2030/200	1903	1902	L	6	T	1	P	4	0.52	0.00	0.52	0	4,200	0	4,200											
594	415	B	72	81	2030/110	1908	1907	C	2	I	2	A	4	1.28	0.00	1.28	0	15,000	0	15,000											

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Road Const	Traffic Serv. Level	Road Main, Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=REC 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xlings	Unstab Soils miles	Switch becks no.	
			T	R	S	from node	to node											road const.	road reconst.	>48" CMP and bridges	total \$						#	diff				
						2219	3501	C 2	0.68		C	2		5	1.16	0.82	1.98	0	0	0	0											
	B				Soalaska	3501	5000	C 2	1.95		C	2		5	3.33	2.34	5.67	0	0	0	0											
	B				Soalaska	5000	35	C 2	8.28		C	2		5	14.16	9.94	24.09	0	0	0	15,000											

Big Salt Group Road Construction	30.1
Big Salt Group Road Reconstruction	0.96
Big Salt Group Private Road Use	10.91
Big Salt Group Road Totals	41.97 miles

Coffman Cove - Coffman Cove LTF																														
574	C	69	82	20	99	9001	2	C	0.36	E	2	P	1	3.42	0.00	3.42	300,000	0	50,000	350,000			1		4				15	
575	C	70	82	3.1	226	228	0.36	L	5	E	5	P	1	0.73	0.00	0.73	54,000	0	4,700	58,700				1	1					4
575	C	70	82	14.1	227	226	0.05	L	5	E	5	P	1	0.10	0.00	0.10	7,500	0	0	7,500										
575	C	70	82	3.5	228	229	0.12	L	4	E	4	P	1	0.36	0.00	0.36	18,000	0	0	18,000	0.01			2						3
575	C	70	82	3.5	229	230	0.34	L	5	E	5	P	1	0.69	0.00	0.69	51,000	0	9,400	60,400										3
575	C	70	82	3.5	230	231	0.08	L	5	E	5	P	1	0.16	0.00	0.16	12,000	0	0	12,000										3
575	C	70	82	3.5	231	232	0.12	L	5	E	5	P	1	0.24	0.00	0.24	18,000	0	0	18,000										2
575	C	70	82	3.1	234	239	0.07	L	6	E	6	P	1	0.17	0.00	0.17	10,500	0	0	10,500					1					
575	C	70	82	3.1	235	9101	0.08	L	5	E	5	P	1	0.16	0.00	0.16	12,000	0	4,700	16,700										2
575	C	70	82	3.2	236	235	0.08	L	5	E	5	P	1	0.16	0.00	0.16	12,000	0	0	12,000										
575	C	70	82	3.1	238	237	0.11	L	6	E	6	P	1	0.27	0.00	0.27	16,500	0	0	16,500	0.06									
575	C	70	82	3.1	239	228	0.04	L	6	E	6	P	1	0.10	0.00	0.10	6,000	0	0	6,000										
575	C	70	82	3.4	240	239	0.06	L	5	E	5	P	1	0.12	0.00	0.12	9,000	0	0	9,000										
575	C	70	82	14.1	241	226	0.07	L	5	E	5	P	1	0.14	0.00	0.14	10,500	0	0	10,500										
577	C	69	81	26.7	3003	3005	0.15	L	4	E	4	P	1	0.46	0.00	0.46	22,500	0	0	22,500										
577	C	69	81	34	3004	3005	0.19	L	4	E	4	P	1	0.58	0.00	0.58	28,500	0	0	28,500										
577	C	69	81	26.7	3005	3007	0.17	L	5	E	5	P	1	0.35	0.00	0.35	25,500	0	0	25,500										
577	C	69	81	26.7	3007	3009	0.57	L	5	E	5	P	1	1.16	0.00	1.16	85,500	0	0	85,500										1
577	C	69	81	26.7	3008	3007	0.02	L	5	E	5	P	1	0.04	0.00	0.04	3,000	0	0	3,000										2
577	C	69	81	26.1	3009	3010	0.16	L	5	E	5	P	1	0.33	0.00	0.33	24,000	0	0	24,000										
577	C	69	81	26.1	3010	3002	0.33	L	5	E	5	P	1	0.67	0.00	0.67	49,500	0	0	49,500										
577	C	69	81	26.1	3011	3013	0.02	L	5	E	5	P	1	0.04	0.00	0.04	3,000	0	0	3,000										
577	C	69	81	26.1	3012	3013	0.03	L	5	E	5	P	1	0.06	0.00	0.06	4,500	0	0	4,500										
577	C	69	81	26.1	3013	3014	0.1	L	5	E	5	P	1	0.20	0.00	0.20	15,000	0	0	15,000										
577	C	69	81	26.1	3014	3009	0.17	L	5	E	5	P	1	0.35	0.00	0.35	25,500	0	0	25,500										
577	C	69	81	26.1	3015	3014	0.05	L	5	E	5	P	1	0.10	0.00	0.10	7,500	0	0	7,500										
574	C	69	81	26	3016	3018	0.11	L	4	E	4	P	1	0.33	0.00	0.33	16,500	0	0	16,500										
574	C	69	81	26.2	3017	3018	0.8	L	5	E	5	P	1	1.63	0.00	1.63	120,000	0	0	120,000										2
577	C	69	81	26	3018	3010	0.48	L	4	E	4	P	1	1.46	0.00	1.46	72,000	0	0	72,000										10
574	C	70	81	3	3401	9000	1.77	C	2	E	2	P	1	3.03	0.00	3.03	265,500	0	4,700	270,200				1						3
574	C	70	81	3	3402	3401	0.45	C	3	E	3	P	1	0.98	0.00	0.98	67,500	0	0	67,500										
574	C	70	81	3.6	3403	3402	0.03	L	5	E	5	P	1	0.06	0.00	0.06	4,500	0	0	4,500										
574	C	70	81	3	3407	3412	0.31	C	2	E	2	P	1	0.53	0.00	0.53	46,500	0	0	46,500										
574	C	70	81	3	3409	3407	0.14	C	2	E	2	P	1	0.24	0.00	0.24	21,000	0	0	21,000										
574	C	70	81	3.5	3410	3407	0.3	L	5	E	5	P	1	0.61	0.00	0.61	45,000	0	0	45,000										
574	C	70	81	3	3412	3402	0.37	C	1	E	1	P	1	1.02	0.00	1.02	55,500	0	0	55,500										
574	C	70	81	3.2	3413	3414	0.1	L	6	E	6	P	1	0.25	0.00	0.25	15,000	0	0	15,000										
574	C	70	81	3	3414	3409	0.31	C	2	E	2	P	1	0.53	0.00	0.53	46,500	0	0	46,500										
574	C	70	81	3	3415	3414	0.1	C	2	E	2	P	1	0.17	0.00	0.17	15,000	0	0	15,000										
574	C	70	81	3	3416	3415	0.17	C	2	E	2	P	1	0.29	0.00	0.29	25,500	0	0	25,500										
574	C	70	81	3	3417	3416	0.46	C	2	E	2	P	1	0.79	0.00	0.79	69,000	0	0	69,000										
574	C	70	81	3.1	3418	3417	0.12	L	5	E	5	P	1	0.24	0.00	0.24	18,000	0	0	18,000										

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number			Road Link		Road Class	Traffic	Road Main Level	Acc-eas Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from node	to node									haul type	const	road const. \$						road reconst. \$	>48" CMP and bridges \$			
574	421	C	70	81	3	3419	3417	C	2	E	P	1	0.97	0.00	0.97	85,500	0	0	0								4	
577	421	C	70	81	3	3420	3419	C	2	E	P	1	0.97	0.00	0.97	85,500	0	4,700	0				1				3	
577	426	C	70	81	1.2	3422	3424	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	0									
577	426	C	70	81	1.2	3423	3420	L	5	E	D	1	1.14	0.00	1.14	84,000	0	0	0									
577	426	C	70	81	1.2	3424	3423	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	0									
577	425	C	70	81	3.1	3427	3426	L	5	E	D	1	0.02	0.00	0.02	1,500	0	0	0								3	
577	425	C	70	81	3.1	3428	9015	L	5	E	D	1	0.61	0.00	0.61	45,000	0	0	0									
577	429	C	70	81	3.1	3429	3428	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	0									
577	423	C	69	81	28.3	4402	4401	L	5	E	D	1	1.61	0.00	1.61	118,500	0	0	0								2	
577	423	C	69	81	28A	4403	4403	L	5	E	D	1	0.20	0.00	0.20	15,000	0	0	0									
577	423	C	69	81	28A	4403	4403	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	0									
577	423	C	69	81	28A	4403	4402	L	5	E	D	1	0.20	0.00	0.20	15,000	0	0	0									
574	440	C	70	82	5.3	9005	9007	L	5	E	D	1	0.08	0.00	0.08	6,000	0	0	0									
574	440	C	70	82	4	9006	9007	L	5	E	D	1	0.02	0.00	0.02	1,500	0	0	0									
574	440	C	70	82	4	9007	9009	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	0									
574	440	C	70	82	4.4	9008	9009	L	5	E	D	1	0.08	0.00	0.08	6,000	0	0	0									
574	440	C	70	82	4	9009	9011	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	0									
574	440	C	70	82	5.1	9010	9011	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	0									
574	440	C	70	82	4	9011	9012	L	5	E	D	1	0.17	0.00	0.17	15,000	0	0	0	0.1			1					
574	439	C	69	82	20	9012	9908	C	2	E	C	2	0.23	0.00	0.23	171,000	0	0	0								6	
577	430	C	70	81	10	9015	9015	L	6	E	D	1	0.77	0.00	0.77	46,500	0	4,700	0								3	
575	408	C	70	82	3.1B	9100	9101	L	5	E	D	1	0.33	0.00	0.33	24,000	0	0	0									
575	415	C	69	82	20	9901	9902	C	2	E	C	2	0.24	0.00	0.24	21,000	0	0	0									
575	415	C	69	82	20	9902	9903	C	2	E	C	2	0.44	0.00	0.44	39,000	0	0	0									
575	439	C	69	82	20	9904	9906	C	1	E	C	2	0.77	0.00	0.77	42,000	0	0	0									
574	439	C	69	82	20	9906	9012	C	2	E	C	2	0.32	0.00	0.32	28,500	0	0	0									
574	442	C	69	82	20	9908	9910	C	1	E	C	2	0.14	0.00	0.14	7,500	0	0	0									
574	442	C	70	82	4.3	9909	9908	L	5	E	D	1	0.14	0.00	0.14	10,500	0	0	0									
574	442	C	69	82	20	9910	9911	C	1	E	C	2	0.19	0.00	0.19	10,500	0	0	0									
574	442	C	69	82	20	9911	9912	C	1	E	C	2	0.30	0.00	0.30	16,500	0	0	0									
574	442	C	69	82	20	9912	9914	C	2	E	C	2	0.07	0.00	0.07	6,000	0	0	0									
574	442	C	70	82	4.2	9913	9912	L	5	E	D	1	0.08	0.00	0.08	6,000	0	0	0									
574	442	C	69	82	20	9914	9916	C	2	E	C	2	2.33	0.00	2.33	204,000	0	0	0								4	
574	442	C	70	82	4.1	9915	9914	L	5	E	D	1	0.08	0.00	0.08	6,000	0	0	0									
574	441	C	69	82	32.1	9917	9916	L	5	E	D	1	0.33	0.00	0.33	24,000	0	0	0									
574	441	C	69	82	32.1	9918	9917	L	5	E	D	1	0.41	0.00	0.41	30,000	0	0	0									
574	441	C	69	82	32.1	9919	9918	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	0									
574	434	C	69	82	32.5	9921	9922	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	0	0.19							3	
574	434	C	69	82	32.5	9922	9924	L	6	E	D	1	0.62	0.00	0.62	37,500	0	0	0									
574	435	C	69	82	32	9924	9928	L	5	E	D	1	0.08	0.00	0.08	6,000	0	0	0									
574	435	C	69	82	32	9926	9927	L	6	E	D	1	0.20	0.00	0.20	12,000	0	0	0									
574	435	C	69	82	32	9927	9930	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	0									
574	435	C	69	82	32	9928	9927	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	0									
574	435	C	69	82	32	9929	9927	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	0									
574	436	C	69	82	32	9930	9933	L	5	E	D	1	0.96	0.00	0.96	70,500	0	0	0	0.04								
574	437	C	69	82	29	9931	9932	L	5	E	D	1	0.31	0.00	0.31	22,500	0	0	0									
574	437	C	69	82	29	9932	9933	L	5	E	D	1	0.45	0.00	0.45	33,000	0	0	0									
574	437	C	69	82	32	9933	9934	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	0									
574	437	C	69	82	20	9934	99	C	2	E	C	2	1.71	0.00	1.71	150,000	0	4,700	0				1				4	
574	434	C	69	82	32.5	9935	9921	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	0	0.04								
575	406	C	70	82	3.5	232	9920	L	5	M	P	2	1.00	0.00	1.00	98,000	0	0	0									

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge > 48" miles	CMP > 48" miles	TTRA xmg	V-Notch xmg		Other Strm xmg	Unstb Sols miles	Switch backs no.				
			T	R	S	from	to										road const. \$	road reconst. \$	>48" CMP and bridges \$	total \$						#	diff							
575	404	C	70	82	3.1	237	235	0.93	L	6	M	P	2	2.30	0.00	2.30	186,000	0	0	186,000								11		1				
577	425	C	70	81	3.1	3425	3426	0.04	L	5	M	P	2	0.08	0.00	0.08	8,000	0	0	8,000								2						
577	429	C	70	81	3.1	3426	3426.1	0.54	L	5	M	P	2	1.10	0.00	1.10	108,000	0	0	108,000								3						
577	425	C	70	81	3.1	3426	3428	0.25	L	5	M	P	2	0.51	0.00	0.51	50,000	0	0	50,000								1						
577	435	C	70	81	3.1	9015	34	0.6	L	5	M	P	2	1.22	0.00	1.22	120,000	0	0	120,000														
574	435	C	69	82	20	9916	9934	0.61	C	2	M	P	2	1.04	0.00	1.04	122,000	0	50,000	172,000	0.13	1		1			2							
574	435	C	69	82	32	9925	9926	0.09	L	5	M	P	2	0.18	0.00	0.18	18,000	0	0	18,000								6						
575	438	C	69	82	20	9903	9904	0.32	C	1	D	P	3	0.88	0.00	0.88	96,000	0	0	96,000	0.16	1												
574	434	C	69	82	32.5	9920	9935	0.16	L	5	D	P	3	0.33	0.00	0.33	48,000	0	50,000	98,000	0.12	1												
		C			3035245	4401	42	0.23	L	5	P	P	6	0.47	0.00	0.47	0	0	50,000	50,000		1												
Coffman Cove Group Road Construction																	4,290,500		0	187,600	4,478,100	0.52	0.41	3	8	11	0	0	171	0	2			
Coffman Cove Group Road Reconstruction And Bridge																	0		0	50,000	50,000	0.00	0.00	1	0	0	0	0	0	0	0	0		
Coffman Cove Group Road Totals																	4,290,500		0	237,600	4,528,100	0.52	0.41	4	8	11	0	0	171	0	2			

Nauketi - Nauketi LTF		70	82	20.2	1655	1650	0.37	L	6	E	D	1	P	1	0.91	0.00	0.91	55,500	0	0	55,500	0.16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number		Road Link	Length miles	Road Class type haul	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing		Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from	to								road const.	road reconst.	>48" CMP and bridges					#	diff			
574	405	N	70	81	25.5	2333	2332	E	1	P	1	0.51	0.00	0.51	37,500	0	0							2		
577	405	N	70	81	24.1	2334	2336	E	1	P	1	2.10	0.00	2.10	154,500	0	0							11		
574	405	N	70	81	25.6	2335	2334	E	1	P	1	0.31	0.00	0.31	22,500	0	0									
577	412	N	70	81	24.1	2336	2318	E	1	P	1	0.55	0.00	0.55	40,500	0	0							1		
577	413	N	70	81	24A	2337	2339	E	1	P	1	0.24	0.00	0.24	18,000	0	0									
577	413	N	70	81	24B	2338	2339	E	1	P	1	0.47	0.00	0.47	34,500	0	0									
577	413	N	70	81	24A	2339	2340	E	1	P	1	0.39	0.00	0.39	28,500	0	0									
577	413	N	70	81	24.2	2340	2336	E	1	P	1	1.00	0.00	1.00	73,500	0	0							1		
577	413	N	70	81	24.2	2341	2340	E	1	P	1	0.31	0.00	0.31	22,500	0	0							1		
577	406	N	70	81	16	2343	2344	E	1	P	1	0.33	0.00	0.33	24,000	0	4,700				1					
577	404	N	70	81	16	2347	2348	E	1	P	1	1.02	0.00	1.02	75,000	0	0							12		
577	404	N	70	81	16	2347	2347	E	1	P	1	0.20	0.00	0.20	15,000	0	0							2		
577	408	N	70	81	16	2348	2350	E	1	P	1	1.16	0.00	1.16	85,500	0	0				1					
577	404	N	70	81	16	2348	2348	E	1	P	1	0.41	0.00	0.41	30,000	0	0							7		
577	409	N	70	81	16	2350	2351	E	1	P	1	1.02	0.00	1.02	75,000	0	0							9		
577	409	N	70	81	16	2350	2350	E	1	P	1	0.24	0.00	0.24	18,000	0	4,700				1					
577	414	N	70	81	16	2351	2352	E	1	P	1	0.37	0.00	0.37	27,000	0	0							3		
577	414	N	70	81	16	2352	2353	E	1	P	1	0.86	0.00	0.86	63,000	0	0							11		
577	415	N	70	81	16	2354	2355	E	1	P	1	1.26	0.00	1.26	93,000	0	0							14		
577	435	N	70	81	16	2355	2356	E	1	P	1	0.37	0.00	0.37	27,000	0	0							3		
577	409	N	70	81	16.1A	2357	2357	E	1	P	1	0.61	0.00	0.61	45,000	0	0							4		
577	415	N	70	81	16.1A	2360	9025	E	1	P	1	0.72	0.00	0.72	43,500	0	0		0.14							
574	416	N	70	81	23	9017	2309	E	1	P	1	0.19	0.00	0.19	16,500	0	0									
574	416	N	70	81	13.7	9020	2312	E	1	P	1	0.24	0.00	0.24	18,000	0	0									
577	410	N	70	81	26	9021	9023	E	1	P	1	0.18	0.00	0.18	13,500	0	0									
577	410	N	70	81	26	9022	9023	E	1	P	1	0.49	0.00	0.49	36,000	0	0									
577	415	N	70	81	26	9023	2348	E	1	P	1	0.43	0.00	0.43	31,500	0	9,400				2					
577	415	N	70	81	16.1A	9025	9023	E	1	P	1	0.65	0.00	0.65	48,000	0	0							2		
577	415	N	70	81	16.1A	9026	9025	E	1	P	1	0.06	0.00	0.06	4,500	0	0									
577	415	N	70	81	16.1A	9027	2360	E	1	P	1	0.10	0.00	0.10	7,500	0	0									
574	406	N	70	81	25.2	9029	2333	E	1	P	1	1.40	0.00	1.40	69,000	0	0		0.03					4		
577	409	N	70	81	16.1	9032	2357	E	1	P	1	0.31	0.00	0.31	22,500	0	0									
574	404	N	70	81	24.1	9033	2326	E	1	P	1	0.67	0.00	0.67	49,500	0	0									
574	404	N	70	81	24.2	9034	9033	E	1	P	1	0.10	0.00	0.10	7,500	0	0									
577	428	N	70	81	13.1	2314	2315	M	1	P	2	0.18	0.00	0.18	18,000	0	0		0.09					11		
574	407	N	70	81	24.1	2325	2326	M	1	P	2	1.49	0.00	1.49	146,000	0	0									
574	407	N	70	81	24.1	2325	2325	M	1	P	2	0.14	0.00	0.14	14,000	0	0									
577	409	N	70	81	16.1	2357	2358	M	1	P	2	1.00	0.00	1.00	98,000	0	0							7		
577	414	N	70	81	16.1	2358	2359	M	1	P	2	1.00	0.00	1.00	98,000	0	0							1		
577	414	N	70	81	16.1	2359	2360	M	1	P	2	0.82	0.00	0.82	80,000	0	0							6		
577	414	N	70	81	16	2360	2360	M	1	P	2	0.20	0.00	0.20	20,000	0	0		0.13					3		
577	405	N	70	81	16	2345	2346	M	1	P	3	1.12	0.00	1.12	165,000	0	0		0.21					1		
577	405	N	70	81	16	2345	2346	M	1	P	3	0.62	0.00	0.62	75,000	0	0		0.25					3		
577	405	N	70	81	16	2346	2347	M	1	P	3	0.47	0.00	0.47	69,000	0	50,000			1				3		
														3,936,000	0	197,000	4,133,000	0.68	0.59	3	10	4	16	0	189	0
														0	0	0	0	0.00	0.00	0	0	0	0	0	0	0
														3,936,000	0	197,000	4,133,000	0.68	0.59	3	10	4	16	0	189	0

Naukitti Group Road Construction
Naukitti Group Road Reconstruction And Bridge Replace
Naukitti Group Road Totals

VCU	Unit	Grp	Road Number		Road Link		Length miles	Road Class type haul	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xlngs	Unstb Solis miles	Switch backs no.		
			T	R	S	from										to	node	const						road	reconst.				>48" CMP and bridges	total
Rio - Thorne Bay LTF																														
597	447	R	72	83	12	403.1	403	L	4	E	D	1	1.52	0.00	1.52	75,000	0	0	75,000											3
597	437	R	72	83	1	405	407	L	5	E	D	1	0.49	0.00	0.49	36,000	0	0	36,000											1
597	437	R	72	83	1.1	406	405	L	5	E	D	1	0.39	0.00	0.39	28,500	0	0	28,500											
597	438	R	72	83	1	410	808.4	L	5	E	D	1	0.45	0.00	0.45	33,000	0	0	33,000											
597	438	R	72	83	1	411	808.4	L	5	E	D	1	0.45	0.00	0.45	33,000	0	0	33,000											
597	435	R	72	83	1	412	413	L	5	E	D	1	0.10	0.00	0.10	7,500	0	0	7,500											1
597	435	R	72	83	1	414	413	L	5	E	D	1	0.47	0.00	0.47	34,500	0	4,700	39,200				1	1	1	D				1
597	435	R	72	83	1	415	414	L	4	E	D	1	0.21	0.00	0.21	10,500	0	0	10,500											1
597	435	R	72	83	1A	416	415	L	5	E	D	1	0.27	0.00	0.27	19,500	0	0	19,500											1
597	435	R	72	83	1	417	426	L	4	E	D	1	0.67	0.00	0.67	33,000	0	0	33,000											1
597	434	R	72	83	26	418	417	L	5	E	D	1	0.16	0.00	0.16	12,000	0	0	12,000											
597	434	R	72	83	26	419	417	L	5	E	D	1	0.37	0.00	0.37	27,000	0	0	27,000											
597	434	R	72	83	26.1	420	419	L	5	E	D	1	0.31	0.00	0.31	22,500	0	0	22,500											
597	434	R	72	83	26	421	422	L	5	E	D	1	0.39	0.00	0.39	28,500	0	0	28,500											
597	434	R	72	83	26	422	419	L	5	E	D	1	0.47	0.00	0.47	34,500	0	0	34,500											
597	435	R	72	83	1	425	415	L	5	E	D	1	0.96	0.00	0.96	70,500	0	0	70,500											
597	425	R	71	83	27.3	501	5	L	5	E	D	1	0.47	0.00	0.47	34,500	0	0	34,500	0.09										1
597	425	R	71	83	27.3	502	501	L	5	E	D	1	0.22	0.00	0.22	16,500	0	0	16,500											
597	424	R	71	83	27.2	601	6	L	5	E	D	1	0.65	0.00	0.65	48,000	0	0	48,000											2
597	422	R	71	83	28.2B	701	7	L	5	E	D	1	0.16	0.00	0.16	12,000	0	0	12,000											1
597		R	71	83	34	808.3	808.2	L	6	E	D	1	0.99	0.00	0.99	60,000	0	0	60,000											1
597		R	71	83	34	808.4	808.3	L	5	E	D	1	0.61	0.00	0.61	45,000	0	0	45,000											1
597	461	R	72	83	14	813	812	L	5	E	D	1	0.96	0.00	0.96	70,500	0	4,700	75,200	0.03										2
597	460	R	72	82	24	814	815	L	5	E	D	1	1.14	0.00	1.14	84,000	0	0	84,000											1
597		R	72	82	14.1	815	811	L	5	E	D	1	3.33	0.00	3.33	244,500	0	4,700	249,200											23
597	460	R	72	82	14.1	816	816.1	L	6	E	D	1	0.35	0.00	0.35	21,000	0	0	21,000	0.07										
597	460	R	72	82	14.1	816.1	815	L	6	E	D	1	0.32	0.00	0.32	19,500	0	0	19,500											
597	422	R	71	83	28.2A	899	801	L	5	E	D	1	0.45	0.00	0.45	33,000	0	0	33,000											
597	410	R	72	83	28.1	901	9151	L	5	E	D	1	0.47	0.00	0.47	34,500	0	0	34,500											
597	418	R	71	83	31.1	1018	1019	L	5	E	D	1	0.37	0.00	0.37	27,000	0	0	27,000											
597	418	R	71	83	31.1	1019	1014	L	5	E	D	1	0.33	0.00	0.33	24,000	0	0	24,000											
597	418	R	71	83	31.2	1019	1019	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	9,000											
597	420	R	71	83	32.1	1020	1021	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	25,500	0.06										2
597	420	R	71	83	32.1	1021	1016	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	25,500											2
597	420	R	71	83	32.1A	1022	1021	L	5	E	D	1	0.31	0.00	0.31	22,500	0	0	22,500											
597	421	R	71	83	29.4	1023	1024	L	5	E	D	1	0.20	0.00	0.20	15,000	0	0	15,000											3
597	421	R	71	83	29.4	1024	1025	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	13,500											
597	421	R	71	83	29.4	1025	1017	L	5	E	D	1	0.20	0.00	0.20	15,000	0	0	15,000											
597	416	R	71	83	31.4	1026	1004	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	18,000											
597		R	72	82	11	1027	1059	L	5	E	D	1	0.35	0.00	0.35	25,500	0	0	25,500											
597	449	R	72	82	14.1	1028	1027	L	5	E	D	1	0.88	0.00	0.88	64,500	0	0	64,500											
597	449	R	72	82	14.1	1029	1028	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	18,000											
597	449	R	72	82	14.1	1030	1029	L	5	E	D	1	0.24	0.00	0.24	18,000	0	0	18,000											
597	449	R	72	82	14.1	1031	1030	L	5	E	D	1	0.41	0.00	0.41	30,000	0	4,700	34,700											4
597	449	R	72	82	14.1	1031	1030	L	5	E	D	1	0.78	0.00	0.78	57,000	0	0	57,000											
597	414	R	72	82	11	1032	1027	L	5	E	D	1	0.18	0.00	0.18	13,500	0	0	13,500											
596	426	R	72	82	11A	1034	1033	L	5	E	D	1	0.41	0.00	0.41	30,000	0	0	30,000											
596	426	R	72	82	11B	1035	1034	L	5	E	D	1	0.12	0.00	0.12	9,000	0	0	9,000											
597	414	R	72	82	11	1036	1033	L	5	E	D	1	1.80	0.00	1.80	132,000	0	0	132,000											
597	414	R	72	82	11	1037	1036	L	5	E	D	1	0.16	0.00	0.16	12,000	0	0	12,000											
597	414	R	72	82	11	1038	1037	L	5	E	D	1	0.16	0.00	0.16	12,000	0	0	12,000											

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	const	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from	to											node	road const. \$	road reconst. \$	>48" CMP and bridges \$						total \$	#			
596		R	72	82	11.2	1042	1027	L	3	E	D	1	P	1	2.46	0.00	2.46	169,500	0	0	0	169,500	0.05				1	E	2		
596	423	R	72	82	11.2	1048	1042	L	5	E	D	1	P	1	0.55	0.00	0.55	40,500	0	0	0	40,500							1		
596	423	R	72	82	11.2A	1051	1050	L	5	E	D	1	P	1	0.06	0.00	0.06	4,500	0	0	0	4,500									
596	423	R	72	82	11.2A	1052	1051	L	5	E	D	1	P	1	0.29	0.00	0.29	21,000	0	0	0	21,000									
596	422	R	72	82	11A	1054	1034	L	5	E	D	1	P	1	0.88	0.00	0.88	64,500	0	0	0	64,500	0.04				1	E	2		
596	422	R	72	82	11A	1055	1054	L	5	E	D	1	P	1	0.31	0.00	0.31	22,500	0	0	0	22,500	0.15								
596	422	R	72	82	11A	1056	1055	L	5	E	D	1	P	1	0.16	0.00	0.16	12,000	0	0	0	12,000	0.03								
596	422	R	72	82	11A	1057	1056	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597		R	72	82	11	1059	1012	L	6	E	D	1	A	1	0.20	0.00	0.20	12,000	0	0	0	12,000	0.04						1		
597	450	R	72	82	14	1060	1010	L	5	E	D	1	A	1	0.37	0.00	0.37	27,000	0	0	0	27,000									
597	450	R	72	82	14	1061	1060	L	5	E	D	1	A	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597	439	R	72	82	7.2	1062	1013	L	5	E	D	1	A	1	1.20	0.00	1.20	88,500	0	0	0	88,500							12		
597	439	R	72	82	7.2	1064	1062	L	5	E	D	1	A	1	0.22	0.00	0.22	16,500	0	0	0	16,500									
597	417	R	71	83	30.9	1066	1065	L	5	E	D	1	A	1	0.37	0.00	0.37	27,000	0	0	0	27,000	0.03						2		
597	419	R	71	83	30.9	1067	1002	L	5	E	D	1	A	1	0.14	0.00	0.14	10,500	0	0	0	10,500	0.07						1		
597	419	R	71	83	30.9A	1068	1067	L	5	E	D	1	A	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597	419	R	71	83	30.9A	1069	1068	L	5	E	D	1	A	1	0.24	0.00	0.24	18,000	0	0	0	18,000									
597	419	R	71	83	30.9	1070	1071	L	6	E	D	1	A	1	0.25	0.00	0.25	15,000	0	0	0	15,000							1		
597	419	R	71	83	30.9	1071	1067	L	5	E	D	1	A	1	0.29	0.00	0.29	21,000	0	0	0	21,000							1		
597	402	R	71	83	29.1	1101	11	C	2	E	C	2	P	1	0.80	0.00	0.80	70,500	0	0	0	70,500									
597	409	R	71	83	29.5	1102	1119	C	2	E	C	2	P	1	0.62	0.00	0.62	54,000	0	0	0	54,000									
597	407	R	71	83	29.6B	1103	1104	L	5	E	D	1	P	1	0.18	0.00	0.18	13,500	0	0	0	13,500									
597	407	R	71	83	29.6	1104	1118	C	2	E	C	2	P	1	0.60	0.00	0.60	52,500	0	0	0	52,500	0.04						4		
597	407	R	71	83	29.6A	1105	1104	C	2	E	C	2	P	1	0.53	0.00	0.53	46,500	0	0	0	46,500									
597		R	71	83	21.1	1106	1117	C	2	E	C	2	P	1	0.75	0.00	0.75	66,000	0	0	0	66,000							3		
597		R	71	83	21.1	1107	1106	L	5	E	D	1	P	1	0.63	0.00	0.63	46,500	0	0	0	46,500	0.08						2		
597	404	R	71	83	21.2	1108	1107	L	5	E	D	1	P	1	0.14	0.00	0.14	10,500	0	0	0	10,500									
597	404	R	71	83	21.1	1109	1116	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597		R	71	83	29.2	1110	1106	C	2	E	C	2	P	1	0.19	0.00	0.19	16,500	0	0	0	16,500									
597	425	R	71	83	29.2	1111	1110	C	2	E	C	2	P	1	0.99	0.00	0.99	87,000	0	0	0	87,000							2		
597	403	R	71	83	20.2	1112	1110	C	2	E	C	2	P	1	0.44	0.00	0.44	39,000	0	0	0	39,000									
597	404	R	71	83	21.1	1114	1116	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597	404	R	71	83	21.1	1115	1109	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0	0	6,000									
597	404	R	71	83	21.1	1116	1107	L	5	E	D	1	P	1	0.18	0.00	0.18	13,500	0	0	0	13,500									
597	407	R	71	83	29.6A	1117	1105	C	2	E	C	2	P	1	0.53	0.00	0.53	46,500	0	0	0	46,500									
597	409	R	71	83	29.5	1118	1102	C	2	E	C	2	P	1	0.17	0.00	0.17	15,000	0	0	0	15,000									
597	402	R	71	83	29.1	1119	1101	C	2	E	C	2	P	1	0.22	0.00	0.22	19,500	0	0	0	19,500									
597	406	R	71	83	28.3	1120	1103	L	5	E	D	1	P	1	1.35	0.00	1.35	99,000	0	0	0	99,000									
597	425	R	71	83	29.2	1121	1111	L	5	E	D	1	P	1	0.24	0.00	0.24	18,000	0	0	0	18,000									
597	404	R	71	83	22.1	1122	1115	L	5	E	D	1	P	1	0.12	0.00	0.12	9,000	0	0	0	9,000									
597	406	R	71	83	29.6B	1123	1120	L	5	E	D	1	P	1	0.31	0.00	0.31	22,500	0	0	0	22,500									
597	403	R	71	83	20.2	1124	1112	L	5	E	D	1	P	1	0.55	0.00	0.55	40,500	0	0	0	40,500									
596	414	R	71	82	25.5	1201	1202	L	5	E	D	1	P	1	1.94	0.00	1.94	142,500	0	0	0	142,500									
597		R	71	82	25.2	1203	1202	C	2	E	C	2	P	1	0.43	0.00	0.43	37,500	0	0	0	37,500									
597	459	R	71	82	25.2C	1205	1204	L	5	E	D	1	P	1	1.16	0.00	1.16	85,500	0	0	0	85,500									
597		R	71	82	25.3A	1207	1203	C	2	E	C	2	P	1	0.36	0.00	0.36	31,500	0	0	0	31,500									
597	457	R	71	82	25.3A	1208	1207	L	5	E	D	1	P	1	0.51	0.00	0.51	37,500	0	0	0	37,500									
597	458	R	71	82	25.3A	1209	1207	C	3	E	C	2	P	1	2.22	0.00	2.22	153,000	0	0	0	153,000	0.32						3		
597	458	R	71	82	36.A	1210	1209	L	5	E	D	1	P	1	0.27	0.00	0.27	19,500	0	0	0	19,500									
596	421	R	71	82	25.3A	1211	1209	C	2	E	C	2	P	1	0.58	0.00	0.58	51,000	0	0	0	51,000									
596	421	R	71	82	25.3A	1213	1211	C	2	E	C	1	P	1	0.17	0.00	0.17	15,000	0	0	0	15,000									

VCU	Unit	Grp	Road Number			Road Link	Length miles	Road Class type haul	Traffic Serv Level	Road Main Level	Acc- eas Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Mech xing		Other Strm xings	Unstab Soils miles	Switch backs no.
			T	R	S	from node	to node									road const. \$	road reconst. \$	>48" CMP and bridges \$	total \$						#	diff			
596 421	R	71	82	25.3A		1214	1213	C	E	2	P	1	0.09	0.00	0.09	7,500	0	0	7,500										
597 459	R	71	82	25.2B		1215	1203	L	E	5	P	1	1.59	0.00	1.59	117,000	0	0	117,000								2		
576 422	R	71	82	14.2		1402	1401	C	E	2	P	1	0.53	0.00	0.53	46,500	0	0	46,500										
576 422	R	71	82	14.2		1403	1402	L	E	5	P	1	0.39	0.00	0.39	28,500	0	0	28,500										
576 422	R	71	82	14.2		1404	1403	L	E	5	P	1	0.39	0.00	0.39	28,500	0	0	28,500										
576 422	R	71	82	14.2		1405	1402	L	E	5	P	1	1.33	0.00	1.33	97,500	0	0	97,500	0.05									
576 422	R	71	82	14.2		1406	1405	L	E	4	P	1	0.30	0.00	0.30	15,000	0	0	15,000										
576 420	R	71	82	14.1		1408	1407	L	E	5	P	1	0.18	0.00	0.18	13,500	0	0	13,500										
576 420	R	71	82	14.1		1409	1408	L	E	5	P	1	0.16	0.00	0.16	12,000	0	0	12,000										
576 420	R	71	82	14.1		1410	1408	L	E	5	P	1	0.33	0.00	0.33	24,000	0	0	24,000	0.07									
596 416	R	71	82	22		1502	1501	C	E	2	P	1	1.86	0.00	1.86	163,500	0	0	163,500										
596 416	R	71	82	22		1503	1502	C	E	2	P	1	0.65	0.00	0.65	57,000	0	0	57,000										
596 416	R	71	82	22		1504	1503	C	E	2	P	1	0.15	0.00	0.15	13,500	0	0	13,500	0.03									
596 416	R	71	82	22		1505	1504	L	E	5	P	1	0.43	0.00	0.43	31,500	0	0	31,500										
596 416	R	71	82	22		1506	1505	L	E	5	P	1	0.27	0.00	0.27	19,500	0	0	19,500										
596 416	R	71	82	27		1508	1504	C	E	2	P	1	0.43	0.00	0.43	37,500	0	0	37,500	0.02									
596 417	R	71	82	27		1509	1508	C	E	2	P	1	0.65	0.00	0.65	57,000	0	4,700	61,700	0.09									
596 417	R	71	82	27		1510	1509	C	E	2	P	1	0.20	0.00	0.20	13,500	0	0	13,500	0.03									
596 417	R	71	82	27		1511	1510	C	E	2	P	1	0.34	0.00	0.34	30,000	0	0	30,000										
596 417	R	71	82	34		1512	1511	L	E	5	P	1	0.35	0.00	0.35	25,500	0	0	25,500										
596 417	R	71	82	34		1513	1512	L	E	5	P	1	0.14	0.00	0.14	10,500	0	0	10,500										
596 419	R	71	82	27		1515	1514	C	E	2	P	1	1.47	0.00	1.47	129,000	0	4,700	133,700										
596 419	R	71	82	27		1516	1515	L	E	5	P	1	0.12	0.00	0.12	9,000	0	0	9,000	0.02									
596 419	R	71	82	27.5		1516	1516	C	E	2	P	1	0.07	0.00	0.07	6,000	0	0	6,000	0.09									
596 420	R	71	82	27.C		1519	1518	C	E	2	P	1	0.07	0.00	0.07	6,000	0	0	6,000										
596 420	R	71	82	27.B		1521	1520	C	E	2	P	1	0.07	0.00	0.07	6,000	0	0	6,000										
596 420	R	71	82	27.A		1523	1522	C	E	2	P	1	0.07	0.00	0.07	6,000	0	0	6,000										
596 418	R	71	82	27		1525	1511	C	E	2	P	1	0.65	0.00	0.65	57,000	0	4,700	61,700	0.07									
596 410	R	71	82	28		1526	1527	L	E	5	P	1	0.49	0.00	0.49	36,000	0	0	36,000										
596 410	R	71	82	28		1527	1527	L	E	5	P	1	0.31	0.00	0.31	22,500	0	4,700	27,200										
596 410	R	71	82	28		1527	1527	L	E	5	P	1	0.75	0.00	0.75	55,500	0	0	55,500										
597 401	R	71	83	30.1		3701	3701	L	E	6	P	1	0.44	0.00	0.44	27,000	0	0	27,000										
597 401	R	71	83	30.1		3702	3701	L	E	6	P	1	0.25	0.00	0.25	15,000	0	0	15,000										
597 401	R	71	83	30.1		3703	3701	L	E	6	P	1	0.20	0.00	0.20	12,000	0	0	12,000	0.04									
576 427	R	71	82	24.5		3901	3901	L	E	6	P	1	0.17	0.00	0.17	10,500	0	0	10,500										
576 427	R	71	82	24.5		3903	3903	L	E	6	P	1	0.20	0.00	0.20	12,000	0	0	12,000										
576 427	R	71	82	24.3		3905	3901	L	E	6	P	1	0.12	0.00	0.12	7,500	0	0	7,500										
576 424	R	71	82	24.3		3906	3905	L	E	6	P	1	1.61	0.00	1.61	97,500	0	0	97,500	0.02									
576 424	R	71	82	24.3		3907	3906	L	E	6	P	1	0.32	0.00	0.32	19,500	0	0	19,500										
576 424	R	71	82	24.3		3908	3909	L	E	6	P	1	0.12	0.00	0.12	7,500	0	0	7,500	0.01									
576 424	R	71	82	24.3		3909	3907	L	E	6	P	1	0.12	0.00	0.12	7,500	0	0	7,500	0.09									
576 424	R	71	82	24.3		3910	3909	L	E	6	P	1	0.22	0.00	0.22	13,500	0	0	13,500										
576 424	R	71	82	24.3		3911	3907	L	E	6	P	1	0.27	0.00	0.27	16,500	0	0	16,500										
576 419	R	71	82	15.9		4001	4001	L	E	5	P	1	0.43	0.00	0.43	31,500	0	0	31,500										
576 419	R	71	82	15.9		4002	4001	L	E	5	P	1	0.06	0.00	0.06	4,500	0	0	4,500										
596 412	R	71	82	15.3		4101	4101	L	E	5	P	1	0.27	0.00	0.27	19,500	0	0	19,500										
596 412	R	71	82	15.3		4102	4101	L	E	5	P	1	0.45	0.00	0.45	33,000	0	0	33,000										
596 412	R	71	82	15.3		4103	4102	L	E	5	P	1	0.18	0.00	0.18	13,500	0	0	13,500	0.05									
596 412	R	71	82	15.3B		4104	4103	L	E	5	P	1	0.06	0.00	0.06	4,500	0	0	4,500										
596 412	R	71	82	15.3A		4105	4103	L	E	5	P	1	0.10	0.00	0.10	7,500	0	0	7,500	0.05									
596 418	R	71	82	15.3		4107	4105	L	E	5	P	1	0.29	0.00	0.29	21,000	0	0	21,000	0.02									

Road Information
(Grouped by Area and LTF)

VCU	Unk	Grp	Road Number			Road Link		Road Class type	Length miles	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=REGN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xings	Unstb Solls miles	Switch backs no.	
			T	R	S	from	to										road const. \$	road reconst. \$	>48" CMP and bridges \$	total \$						#	diff				
576	418	R	71	82	15.3	4108	4107	L	0.13	E	1	P	1	0.32	0.00	0.32	19,500	0	0	0.13											
597	426	R	71	83	33.1	8021	802	L	0.2	E	1	A	1	0.41	0.00	0.41	30,000	0	0									1			
597	426	R	71	83	33.1	8022	8021	L	0.1	E	1	A	1	0.20	0.00	0.20	15,000	0	0												
597	427	R	71	83	33.1	8023	8022	L	0.4	E	1	A	1	0.82	0.00	0.82	60,000	0	0	0.19											
597	427	R	71	83	33.6	8024	8025	L	0.11	E	1	A	1	0.22	0.00	0.22	16,500	0	0									1			
597	427	R	71	83	33.1	8025	8023	L	0.1	E	1	A	1	0.20	0.00	0.20	15,000	0	0	0.03								1			
597	427	R	71	83	33.1	8026	8025	L	0.1	E	1	A	1	0.20	0.00	0.20	15,000	0	0												
597	430	R	71	83	33.3	8041	804	L	0.34	E	1	A	1	0.69	0.00	0.69	51,000	0	0												
597	430	R	71	83	33.2	8043	8044	L	0.05	E	1	A	1	0.10	0.00	0.10	7,500	0	0												
597	430	R	71	83	33.2	8044	804	L	0.02	E	1	A	1	0.04	0.00	0.04	3,000	0	0												
597	428	R	71	83	34.2	8321	808	L	0.44	E	1	A	1	0.90	0.00	0.90	66,000	0	0									5			
597	428	R	71	83	34.2A	8322	8325	L	0.08	E	1	A	1	0.16	0.00	0.16	12,000	0	0												
597	428	R	71	83	34.2	8323	8321	L	0.11	E	1	A	1	0.22	0.00	0.22	16,500	0	0												
597	428	R	71	83	34.2	8324	8323	L	0.08	E	1	A	1	0.16	0.00	0.16	12,000	0	0												
597	428	R	71	83	34.2A	8325	8321	L	0.08	E	1	A	1	0.16	0.00	0.16	12,000	0	0												
576	427	R	71	82	24.3	9140	3910	L	0.32	E	1	P	1	0.65	0.00	0.65	48,000	0	0												
596	413	R	71	82	24.1	9146	9148	L	0.15	E	1	P	1	0.31	0.00	0.31	22,500	0	0												
596	413	R	71	82	24.1A	9147	9148	L	0.16	E	1	P	1	0.33	0.00	0.33	24,000	0	0												
596	413	R	71	82	24.1	9148	9149	L	0.48	E	1	P	1	0.98	0.00	0.98	72,000	0	0												
597	410	R	72	83	28.1	9151	9	L	0.15	E	1	P	1	0.31	0.00	0.31	22,500	0	0												
597	410	R	72	83	28.2	9152	9151	L	0.2	E	1	P	1	0.41	0.00	0.41	30,000	0	0												
597	448	R	71	83	33.4	9155	807	L	0.08	E	1	A	1	0.16	0.00	0.16	12,000	0	0												
596	422	R	72	82	11A	9158	9158	L	0.19	E	1	P	1	0.39	0.00	0.39	28,500	0	0									1			
596	422	R	72	82	11A	9158	1057	L	0.19	E	1	P	1	0.39	0.00	0.39	28,500	0	0												
597	438	R	72	83	1	407	408	L	0.43	E	1	A	2	0.88	0.00	0.88	86,000	0	0												
597	438	R	72	83	1	408	410	L	0.13	E	1	A	2	0.27	0.00	0.27	26,000	0	0												
597	438	R	72	83	1	409	408	L	0.04	E	1	A	2	0.08	0.00	0.08	8,000	0	0	0.03											
597	435	R	72	83	1	413	411	L	0.07	E	1	A	2	0.17	0.00	0.17	14,000	0	0									1			
596	423	R	72	82	11.2	1053	1050	L	0.16	E	1	P	2	0.33	0.00	0.33	32,000	0	0									1			
597	414	R	72	82	11.1	1058	1036	L	0.35	E	1	P	2	0.71	0.00	0.71	70,000	0	0									1			
596	414	R	71	82	25.5	1202	12	C	0.57	E	1	P	2	0.97	0.00	0.97	114,000	0	0									2			
597	459	R	71	82	25.2B	1204	1215	L	0.13	E	1	P	2	0.27	0.00	0.27	26,000	0	0	0.05								1			
597	459	R	71	82	25.2B	1206	1204	L	0.23	E	1	P	2	0.47	0.00	0.47	46,000	0	0									2			
596	415	R	71	82	25	1216	12	L	0.7	E	1	P	2	1.43	0.00	1.43	140,000	0	0									1			
596	415	R	71	82	25	1217	1216	L	0.11	E	1	P	2	0.22	0.00	0.22	22,000	0	0												
596	415	R	71	82	25	1218	1216	L	0.56	E	1	P	2	1.14	0.00	1.14	112,000	0	0	0.17								1			
596	415	R	71	82	25	1219	1218	L	0.56	E	1	P	2	1.14	0.00	1.14	112,000	0	0	0.17								2			
576	423	R	71	82	24.2	1301	13	L	0.69	E	1	P	2	1.41	0.00	1.41	138,000	0	0	0.22								4			
576	423	R	71	82	24.2	1302	1301	L	0.34	E	1	P	2	0.69	0.00	0.69	68,000	0	0									2			
576	423	R	71	82	14.1	1401	14	C	0.28	E	1	P	2	0.48	0.00	0.48	56,000	0	0												
576	420	R	71	82	14.1	1407	1401	L	0.09	E	1	P	2	0.18	0.00	0.18	18,000	0	0									1			
576	420	R	71	82	14.1	1411	1410	L	0.16	E	1	P	2	0.49	0.00	0.49	32,000	0	0	0.13								1			
576	420	R	71	82	14.1	1412	1411	L	0.31	E	1	P	2	0.77	0.00	0.77	62,000	0	0	0.12								1			
596	418	R	71	82	27	1514	1525	C	0.15	E	1	P	2	0.33	0.00	0.33	30,000	0	0	0.11								1			
596	419	R	71	82	27	1516	1515	C	0.08	E	1	P	2	0.14	0.00	0.14	16,000	0	0									1			
596	419	R	71	82	27	1517	1516	C	0.28	E	1	P	2	0.48	0.00	0.48	56,000	0	0									1			
596	420	R	71	82	27	1518	1517	C	0.43	E	1	P	2	0.74	0.00	0.74	86,000	0	0									1			
596	420	R	71	82	27	1520	1518	C	0.15	E	1	P	2	0.26	0.00	0.26	30,000	0	0									1			
596	420	R	71	82	27	1522	1520	C	0.11	E	1	P	2	0.19	0.00	0.19	22,000	0	0									1			
596	420	R	71	82	27	1524	1522	C	0.15	E	1	P	2	0.26	0.00	0.26	30,000	0	0									1			
576	427	R	71	83	30	3801	38	L	0.22	E	1	P	2	0.54	0.00	0.54	44,000	0	0	0.02											1

VCU	Unk	Gp	Road Number			Road Link		Length miles	Road Class type haul	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=REC 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Bridge	CMP > 48" miles	TTRA xing		Other Strm xings	Unstd Soils miles	Switch backs no.	
			T	R	S	from node	to node										road const. \$	road reconst. \$	>48" CMP and bridges \$	total \$				#	diff				
597		R	72	83	1	424	425	L	6	D	1	P	3	0.17	0.00	0.17	21,000	0	0	0.07								1	
597		R	72	83	1	426	424	L	4	D	1	P	3	0.27	0.00	0.27	27,000	0	0	0.09									
597	414	R	72	82	11	1033	1032	L	5	D	1	P	3	0.37	0.00	0.37	54,000	0	0	0.13									
596	423	R	72	82	11.2	1049	1048	L	5	D	1	P	3	0.12	0.00	0.12	18,000	0	0										
596	423	R	72	82	11.2	1050	1049	L	5	D	1	P	3	0.39	0.00	0.39	57,000	0	0	0.15									
597	439	R	72	82	7.2	1063	1064	L	5	D	1	P	3	0.39	0.00	0.39	57,000	0	0										
		R			3012210	1008	1007	C	2	T	1	4	2.19	0.00	2.19	0	25,600	50,000	75,600	1									
		R			3012210	1009	1008	C	2	T	1	4	1.50	0.00	1.50	0	17,600	0	17,600										
		R			3012210	1010	1009	L	5	D	2	4	0.41	0.00	0.41	0	4,000	0	4,000										
		R			3012600	1012	1011	L	6	P	1	4	3.09	0.00	3.09	0	25,000	50,000	75,000	1									
		R			3012180	1013	1006	L	6	D	1	4	4.57	0.00	4.57	0	37,000	0	37,000										
		R			3012120	1017	1015	L	5	D	1	4	0.96	0.00	0.96	0	9,400	0	9,400										
		R			3012120	1065	1002	L	5	WB	1	4	0.73	0.00	0.73	0	7,200	0	7,200										
		R			3012	1011	1008	C	2	4XP	1	6	3.59	0.00	3.59	0	0	200,000	200,000										
Rio Group Road Construction																7,785,500	0	42,300	7,827,800	3.08	1.05	0	9	10	8	0	189	0	14
Rio Group Road Reconstruction And Bridge Replacemen																0	125,800	300,000	425,800	0.00	0.00	6	0	0	0	0	0	0	0
Rio Group Road Totals																7,785,500	125,800	342,300	8,253,600	3.08	1.05	6	9	10	8	0	189	0	14
																54.92 miles													

Rio Group Road Construction

Rio Group Road Reconstruction And Bridge Replacemen

Rio Group Road Totals

Thorne River Group - Thorne Bay LTF

575	419	T	70	82	12A	211.1	9106	L	5	E	1	P	0.16	0.00	0.16	12,000	0	0											
575	419	T	70	82	12A	212	212.1	L	5	E	1	P	0.16	0.00	0.16	12,000	0	0											
575	419	T	70	82	12A	212.1	9106	L	5	E	1	P	0.16	0.00	0.16	12,000	0	0											
575	411	T	70	82	12A	213	213.1	L	4	E	1	P	1.34	0.00	1.34	66,000	0	4,700	70,700										
575	411	T	70	82	12A	213.1	212	L	4	E	1	P	0.30	0.00	0.30	15,000	0	0	15,000										
575	410	T	70	82	12A	214	213	L	5	E	1	P	0.67	0.00	0.67	49,500	0	0	49,500	0.12									
575	410	T	70	82	12B	214.1	214	L	5	E	1	P	0.10	0.00	0.10	7,500	0	0	7,500										
575	409	T	70	82	11.1A	215	216	L	5	E	1	P	0.37	0.00	0.37	27,000	0	0	27,000										
575	409	T	70	82	11.1A	216	217	L	5	E	1	P	0.22	0.00	0.22	16,500	0	0	16,500										
575	409	T	70	82	11.1A	217	225	L	5	E	1	P	0.33	0.00	0.33	24,000	0	0	24,000										
575	412	T	70	82	11.3	218.3	218.2	L	5	E	1	P	0.20	0.00	0.20	15,000	0	0	15,000										
575	413	T	70	82	11.2	219.1	219	L	6	E	1	P	0.22	0.00	0.22	13,500	0	0	13,500										
575		T	70	82	14	220	210	L	5	E	1	P	1.18	0.00	1.18	87,000	0	50,000	137,000	0.07									
575	412	T	70	82	14	221	221.1	L	5	E	1	P	0.22	0.00	0.22	16,500	0	0	16,500										
575	412	T	70	82	14	221.1	220	L	5	E	1	P	1.22	0.00	1.22	90,000	0	0	90,000										
575	414	T	70	82	14.1	222	223	L	5	E	1	P	1.02	0.00	1.02	75,000	0	0	75,000										
575		T	70	82	14.1	223	210	L	5	E	1	P	1.02	0.00	1.02	75,000	0	0	125,000										
575	417	T	70	82	11.3	224	223	L	5	E	1	P	1.49	0.00	1.49	109,500	0	0	109,500										
575	417	T	70	82	11.3	224.1	224	L	5	E	1	P	0.51	0.00	0.51	37,500	0	0	37,500										
575	437	T	71	82	32	248	250	L	5	E	1	P	0.29	0.00	0.29	21,000	0	0	21,000										
575	437	T	70	83	32	248.1	248	L	5	E	1	P	0.41	0.00	0.41	30,000	0	0	30,000										
575	437	T	70	83	32.1	248.2	248	L	5	E	1	P	0.24	0.00	0.24	18,000	0	0	18,000										
575	437	T	71	82	32	249	250	L	5	E	1	P	0.24	0.00	0.24	18,000	0	0	18,000										
578	437	T	70	83	32.2	249.1	249	L	5	E	1	P	0.16	0.00	0.16	12,000	0	0	12,000										
578	437	T	70	82	32.2A	249.2	249	L	5	E	1	P	0.08	0.00	0.08	6,000	0	0	6,000										
578		T	71	82	32	250	206	L	5	E	1	P	1.41	0.00	1.41	103,500	0	4,700	108,200	0.09									
578	401	T	72	83	34.1	251	252	L	5	E	1	P	0.65	0.00	0.65	48,000	0	0	48,000										
578	401	T	72	83	34.1	252	253	L	5	E	1	P	1.00	0.00	1.00	73,500	0	0	73,500										
578	401	T	72	83	34.1	253	254	L	5	E	1	P	0.37	0.00	0.37	27,000	0	0	27,000										
578	401	T	72	83	34.1	254	204	L	5	E	1	P	1.00	0.00	1.00	73,500	0	0	73,500										
575	432	T	70	83	30	255	256	L	4	E	1	P	0.64	0.00	0.64	31,500	0	0	31,500	0.15									
575	432	T	70	82	30A	255.1	255	L	5	E	1	P	0.08	0.00	0.08	6,000	0	0	6,000										

Road Information
(Grouped by Area and LTF)

VCU	Unit	Gp	Road Number			Road Link		Length miles	Road Class type	Traffic		Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			CMP > 48"	TTRA xing	V-Notch xing		Other Strm xings	Unstb Soils miles	Switch backs no.	
			T	R	S	from	to			Serv Level	const							road const. \$	road reconst. \$	>48" CMP and bridges \$			total \$	#				diff
575	432	T	70	82	30A	256.1	256	0.01	L	5	E	D	1	P	1	0.02	0.00	0.02	1,500	0	0	1	1					
575	423	T	70	83	30	258.1	258	0.09	L	5	E	D	1	P	1	0.18	0.00	0.18	13,500	0	0					1		
578	404	T	71	83	14.2	290	202	0.27	L	5	E	D	1	P	1	0.55	0.00	0.55	40,500	0	0				1			
578	403	T	71	83	14.1	291	293	0.16	L	5	E	D	1	P	1	0.33	0.00	0.33	24,000	0	0							
578	403	T	71	83	14.1A	292	293	0.04	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0				1			
578	403	T	71	83	14.1	293	203	0.03	L	5	E	D	1	P	1	0.06	0.00	0.06	4,500	0	0							
576	417	T	71	82	11	1605	1604	0.71	C	2	E	C	2	P	1	1.21	0.00	1.21	106,500	0	0	1	1					
576	417	T	71	82	11.3	1606	1605	0.44	L	5	E	D	1	P	1	0.90	0.00	0.90	66,000	0	4,700							
576	417	T	71	82	11.3	1607	9136	0.12	L	5	E	D	1	P	1	0.24	0.00	0.24	18,000	0	0							
576	416	T	71	82	12	1609	1612	0.3	L	5	E	D	1	P	1	0.61	0.00	0.61	45,000	0	0				5			
576	415	T	70	82	12.1	1610	9134	0.41	L	5	E	D	1	P	1	0.84	0.00	0.84	61,500	0	0				4			
576	415	T	71	82	12.1	1611	1610	0.29	L	5	E	D	1	P	1	0.59	0.00	0.59	43,500	0	0				1			
576	416	T	71	82	11	1612	1605	0.22	C	2	E	C	2	P	1	0.38	0.00	0.38	33,000	0	0				2			
576	416	T	71	82	11	1613	1620	0.07	L	5	E	D	1	P	1	0.14	0.00	0.14	10,500	0	0				1			
576	413	T	71	82	11	1614	1613	1.16	L	5	E	D	1	P	1	2.37	0.00	2.37	174,000	0	9,400				2			
576	413	T	71	82	11	1615	1614	0.14	L	5	E	D	1	P	1	0.29	0.00	0.29	21,000	0	0				5			
576	413	T	71	82	11	1616	1615	0.14	L	5	E	D	1	P	1	0.29	0.00	0.29	21,000	0	0				5			
576	414	T	71	82	11	1617	1616	0.29	L	5	E	D	1	P	1	0.59	0.00	0.59	43,500	0	0				1			
576	414	T	71	82	11	1618	1617	0.12	L	5	E	D	1	P	1	0.24	0.00	0.24	18,000	0	0				1			
576	414	T	71	82	12.3	1619	1617	0.08	L	5	E	D	1	P	1	0.16	0.00	0.16	12,000	0	0				1			
576	416	T	71	82	11	1620	1612	0.05	L	5	E	D	1	P	1	0.10	0.00	0.10	7,500	0	0				2			
576	416	T	71	82	11	1621	1613	0.06	L	5	E	D	1	P	1	0.12	0.00	0.12	9,000	0	0				2			
576	434	T	71	82	2	1622	1623	0.06	C	3	E	C	2	P	1	0.13	0.00	0.13	9,000	0	4,700	1						
576	434	T	71	82	2	1623	1624	0.08	C	3	E	C	2	P	1	0.17	0.00	0.17	12,000	0	0							
576	434	T	71	82	2	1624	1625	0.66	C	2	E	C	2	P	1	1.13	0.00	1.13	99,000	0	18,800	4	1	2	M			
576	433	T	71	82	2	1625	1627	0.16	C	2	E	C	2	P	1	0.27	0.00	0.27	24,000	0	0							
576	433	T	71	82	2.3	1626	1625	0.03	L	5	E	D	1	P	1	0.06	0.00	0.06	4,500	0	0							
576	433	T	71	82	2	1627	1628	0.05	C	2	E	C	2	P	1	0.09	0.00	0.09	7,500	0	0							
576	433	T	71	82	2	1628	1629	0.09	C	2	E	C	2	P	1	0.15	0.00	0.15	13,500	0	0							
576	432	T	71	82	2	1630	1631	0.05	C	2	E	C	2	P	1	0.09	0.00	0.09	7,500	0	0							
576	432	T	71	82	2	1631	1633	0.07	C	2	E	C	2	P	1	0.12	0.00	0.12	10,500	0	0							
576	432	T	71	82	2.1	1632	1633	0.03	L	5	E	D	1	P	1	0.06	0.00	0.06	4,500	0	0							
576	432	T	71	82	2	1633	1605	0.21	C	2	E	C	2	P	1	0.36	0.00	0.36	31,500	0	4,700	1	1					
576	429	T	71	82	10	1634	1603	0.21	C	2	E	C	2	P	1	0.16	0.00	0.16	12,000	0	0							
576	429	T	71	82	10	1635	1634	0.04	L	5	E	D	1	P	1	0.08	0.00	0.08	6,000	0	0							
576	429	T	71	82	10.1	1636	1634	0.09	L	5	E	D	1	P	1	0.18	0.00	0.18	13,500	0	0							
576	433	T	71	82	2.2	1637	1627	0.03	L	5	E	D	1	P	1	0.06	0.00	0.06	4,500	0	0							
574	429	T	70	82	20	1643	1644	0.15	L	5	E	D	1	P	1	0.31	0.00	0.31	22,500	0	0							
574	429	T	70	82	20	1644	1645	0.16	L	5	E	D	1	P	1	0.33	0.00	0.33	24,000	0	0							
574	429	T	70	82	20	1645	1646	0.84	L	5	E	D	1	P	1	1.71	0.00	1.71	126,000	0	4,700	1	1					
574	409	T	70	82	20	1647	1648	0.43	L	5	E	D	1	P	1	0.88	0.00	0.88	64,500	0	0							
574	409	T	70	82	28	1648	1650	0.42	L	5	E	D	1	P	1	0.86	0.00	0.86	63,000	0	0							
574	409	T	70	82	28	1649	1649	0.17	L	5	E	D	1	P	1	0.35	0.00	0.35	25,500	0	0							
574	409	T	70	82	28	1650	1642	0.85	L	5	E	D	1	P	1	1.73	0.00	1.73	127,500	0	0							
576	402	T	70	82	20.2	1651	1651	0.12	L	6	E	D	1	P	1	0.30	0.00	0.30	18,000	0	4,700	1						
576	402	T	70	82	20.2	1652	1652	0.74	L	6	E	D	1	P	1	1.83	0.00	1.83	111,000	0	0							
574	408	T	70	82	20.2	1653	1654	0.08	L	6	E	D	1	P	1	0.20	0.00	0.20	12,000	0	0							
576	401	T	70	82	29	1653	1652	0.82	L	5	E	D	1	P	1	1.67	0.00	1.67	123,000	0	0							
574	408	T	70	82	20.2	1654	1655	0.11	L	4	E	D	1	P	1	0.33	0.00	0.33	16,500	0	0							
575	430	T	70	82	26.9	1666	1667	0.24	L	4	E	D	1	P	1	0.73	0.00	0.73	36,000	0								

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Traffic Serv Level	Road Main Level	Access Man.	1=EASY 2=MED 3=DIFF 4=REC 5=PRIV	Variable \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xmg	V-Notch xmg		Other Strm xings	Unstb Sols miles	Switch backs no.
			T	R	S	from	to										road const.	road reconst.	>48" CMP and bridges	total \$						#	diff			
576	405	T	71	82	3	1675	1674	L	5	E	1	P	1	0.49	0.00	0.49	36,000	0	0	36,000										
576	405	T	71	82	3	1676	1675	L	5	E	1	P	1	0.18	0.00	0.18	13,500	0	4,700	18,200			1			1	E		6	
596	405	T	71	82	15.1	1689	1602	C	2	E	1	P	1	0.79	0.00	0.79	69,000	0	4,700	73,700			1						2	
596	405	T	71	82	15.1	1690	1689	C	5	E	2	P	1	0.29	0.00	0.29	21,000	0	0	21,000									2	
596	405	T	71	82	15.1	1691	1690	C	5	E	2	P	1	0.24	0.00	0.24	18,000	0	0	18,000									2	
596	405	T	71	82	15.1	1692	1691	C	5	E	2	P	1	0.24	0.00	0.24	18,000	0	0	18,000									2	
596	405	T	71	82	15.1	1693	1692	C	5	E	2	P	1	0.27	0.00	0.27	19,500	0	0	19,500									2	
596	403	T	71	82	15.1	1694	1693	C	5	E	2	P	1	1.61	0.00	1.61	118,500	0	0	118,500	0.05							9		
596	403	T	71	82	15.2	1695	1696	L	6	E	1	P	1	0.67	0.00	0.67	40,500	0	0	40,500	0.27							4		
596	402	T	71	82	15.1	1696	1694	L	6	E	1	P	1	0.84	0.00	0.84	51,000	0	0	51,000	0.29							2		
596	402	T	71	82	15.1	1697	1697	L	5	E	1	P	1	1.84	0.00	1.84	135,000	0	0	135,000								2		
596	401	T	71	82	15.1	1698	1697	L	5	E	1	P	1	1.20	0.00	1.20	88,500	0	50,000	138,500	0.23	1						6		
576	409	T	70	82	27.3	9036	9037	L	5	E	1	P	1	0.27	0.00	0.27	19,500	0	0	19,500										
576	409	T	70	82	27.4	9038	1657	L	5	E	1	P	1	0.04	0.00	0.04	3,000	0	0	3,000										
576	409	T	70	82	27.2	9039	9040	L	5	E	1	P	1	0.24	0.00	0.24	18,000	0	0	18,000										
576	409	T	70	82	27.2	9040	1656	L	5	E	1	P	1	0.22	0.00	0.22	16,500	0	0	16,500										
575	419	T	70	82	12B	9103	212	L	5	E	1	P	1	0.06	0.00	0.06	4,500	0	0	4,500										
575	419	T	70	82	12A	9106	211	L	5	E	1	P	1	0.33	0.00	0.33	24,000	0	0	24,000								2		
575	424	T	70	82	13.1	9109	9110	L	6	E	1	P	1	0.72	0.00	0.72	43,500	0	0	43,500										
575	417	T	82	70	11.3A	9111	224	L	5	E	1	P	1	0.16	0.00	0.16	12,000	0	0	12,000										
575	425	T	70	82	13.3	9113	9115	L	6	E	1	P	1	0.22	0.00	0.22	13,500	0	0	13,500										
575	425	T	70	82	13.2	9114	9115	L	6	E	1	P	1	0.25	0.00	0.25	15,000	0	0	15,000										
575	425	T	70	82	13.2	9115	9112	L	6	E	1	P	1	0.37	0.00	0.37	22,500	0	0	22,500										
576	416	T	70	82	12.1	9134	1609	L	5	E	1	P	1	0.84	0.00	0.84	61,500	0	0	61,500								1		
576	417	T	71	82	11.4	9135	9136	L	5	E	1	P	1	0.08	0.00	0.08	6,000	0	0	6,000										
576	417	T	71	82	11.3	9136	1606	L	5	E	1	P	1	0.22	0.00	0.22	16,500	0	0	16,500										
575	417	T	70	82	11.1	218	218.1	L	6	M	1	P	2	1.06	0.00	1.06	86,000	0	0	86,000								6		
575	413	T	70	82	11.1	218.1	220	L	6	M	1	P	2	1.06	0.00	1.06	86,000	0	0	86,000								7		
575	413	T	70	82	11.2	218.2	218	L	6	M	1	P	2	0.20	0.00	0.20	16,000	0	0	16,000								1		
575	413	T	70	82	11.2	219	218.2	L	6	M	1	P	2	0.42	0.00	0.42	34,000	0	0	34,000										
575	413	T	70	82	11.1	225	218	L	6	M	1	P	2	0.62	0.00	0.62	50,000	0	0	50,000										
575	432	T	70	82	13	246	208	L	5	M	1	P	2	0.39	0.00	0.39	38,000	0	0	38,000										
575	432	T	70	82	30	256	257	L	4	M	1	P	2	2.46	0.00	2.46	162,000	0	4,700	166,700	0.08		1					3		
575	423	T	70	83	30	258	255	L	4	M	1	P	2	1.37	0.00	1.37	90,000	0	0	90,000	0.07									
576	433	T	71	82	2	1629	1630	C	2	M	2	P	2	0.70	0.00	0.70	82,000	0	18,800	100,800								1		
574	431	T	70	82	20	1646	1647	L	4	M	1	P	2	2.46	0.00	2.46	162,000	0	0	162,000	0.12							2		
574	409	T	70	82	28	1649	1648	L	5	M	1	P	2	0.22	0.00	0.22	22,000	0	0	22,000										
576	409	T	70	82	34.1	1656	1657	L	6	M	1	P	2	0.74	0.00	0.74	60,000	0	0	60,000	0.29							3		
576	409	T	70	82	34.1	1657	1640	L	6	M	1	P	2	0.96	0.00	0.96	78,000	0	0	78,000										
576	409	T	70	82	34.1	1658	1641	L	5	M	1	P	2	2.24	0.00	2.24	220,000	0	4,700	224,700	0.08		1					12		
575	436	T	70	82	34.1	1667	1668	L	4	M	1	P	2	4.13	0.00	4.13	272,000	0	0	272,000	0.1							11		
575	436	T	70	82	34.1	1668	1669	L	5	M	1	P	2	0.39	0.00	0.39	38,000	0	0	38,000										
576	411	T	70	82	34.1	1669	1669	L	5	M	1	P	2	0.78	0.00	0.78	76,000	0	0	76,000										
576	411	T	70	82	34.1	1669	1656	L	5	M	1	P	2	3.18	0.00	3.18	312,000	0	4,700	316,700	0.13							5		
575	422	T	70	82	34.1	1670	1671	L	4	M	1	P	2	1.34	0.00	1.34	88,000	0	0	88,000	0.03							4		
575	422	T	70	82	34.1	1671	1673	L	6	M	1	P	2	1.04	0.00	1.04	84,000	0	0	84,000	0.11							3		
575	421	T	70	82	34.1	1673	1658	L	5	M	1	P	2	1.88	0.00	1.88	184,000	0	4,700	188,700	0.18							9		
575	421	T	70	82	34.1	1673	1671	L	4	M	1	P	2	0.64	0.00	0.64	42,000	0	0	42,000	0.11							2		
576	405	T	71	82	3	1674	1639	L	5	M	1	P	2	1.16	0.00	1.16	114,000	0	50,000	164,000								7		

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number		Road Link		Length miles	Road Class type	Traffic Serv Level	Road Malt. Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=REC 5=PRV	Variab l \$/mbf	Native ld \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge > 48" miles	CMP > 48" miles	TTRA xing	V-Norch xing	Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from node	to node									road const.	road reconst.	> 48" CMP and bridges									
596	402	T	71	82	15.1	1697	1696	0.37	L	6	M	D	1	0.91	0.00	0.91	0	0	0	0.26	0.15	1		2	M	4	
596	401	T	71	82	15.1	1699	1698	0.15	L	5	M	D	1	0.31	0.00	0.31	0	0	54,700	0.08					2		
576	409	T	70	82	34.1	9037	1657	0.09	L	6	M	D	1	0.22	0.00	0.22	0	0	0								
576	409	T	70	82	27.1	9041	9040	0.11	L	5	M	D	1	0.22	0.00	0.22	0	0	0								
		T			301550	210	209	0.8	C	1		C	2	2.20	0.00	2.20	0	16,000	0								
								39.56																			
Thorne Group Road Construction								0.80																			
Thorne Group Road Reconstruction And Bridge Replace								40.36	miles																		
Thorne Group Road Totals																											

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591	W	F.S.	P	LINE	3207	3285	0.73	L	5	E	D	1	1.49	0.00	1.49	0	0	0									
591	W	F.S.	P	LINE	3208	3207	0.88	L	5	E	D	1	1.80	0.00	1.80	0	0	0									
591	W	F.S.	P	LINE	3209	3208	0.18	L	5	E	D	1	0.37	0.00	0.37	0	0	0									
591	W	F.S.	P	LINE	3210	3209	0.4	L	5	E	D	1	0.82	0.00	0.82	0	0	0									
594	420	W	71	80	30	3211	3218	1.39	L	5	E	1	2.84	0.00	2.84	0	0	0									25
594	420	W	71	80	30	3212	3211	0.2	L	5	E	1	0.41	0.00	0.41	0	0	0									12
594	420	W	71	80	30	3213	3212	0.32	L	5	E	1	0.65	0.00	0.65	0	0	0									7
594	420	W	71	80	30	3215	3214	0.36	L	5	E	1	0.73	0.00	0.73	0	0	0									8
594	413	W	71	80	27.1	3216	3216	0.06	L	5	E	1	0.12	0.00	0.12	0	0	0									2
594	411	W	71	80	30	3217	3215	0.25	L	5	E	1	0.51	0.00	0.51	0	0	0									8
594	411	W	71	80	30	3217	3217	0.12	L	5	E	1	0.24	0.00	0.24	0	0	0									1
594	411	W	71	80	30	3218	3219	0.88	L	5	E	1	1.80	0.00	1.80	0	0	0									8
592	408	W	71	79	13.2	3220	3221	0.07	L	5	E	1	0.14	0.00	0.14	0	0	0									
592	408	W	71	79	13.2	3221	3244	0.26	L	5	E	1	0.53	0.00	0.53	0	0	0									1
592	408	W	71	79	13.2	3222	3220	0.21	L	5	E	1	0.43	0.00	0.43	0	0	50,000									1
592	404	W	71	79	12.3	3223	3251	0.06	L	6	E	1	0.15	0.00	0.15	0	0	0									3
592	410	W	71	79	28.1	3225	3226	0.24	L	5	E	1	0.49	0.00	0.49	0	0	0									3
592	410	W	71	79	28.1	3226	3227	0.03	L	5	E	1	0.06	0.00	0.06	0	0	0									4
592	410	W	71	79	28	3227	3229	0.85	L	5	E	1	1.73	0.00	1.73	0	0	0									2
592	410	W	71	79	28	3228	3227	0.1	L	5	E	1	0.20	0.00	0.20	0	0	0									2
592	409	W	71	79	28	3229	3230	0.13	L	5	E	1	0.27	0.00	0.27	0	0	0									3
592	409	W	71	79	28	3230	3231	0.16	L	5	E	1	0.33	0.00	0.33	0	0	0									3
592	409	W	71	79	28	3231	3232	0.2	L	6	E	1	0.49	0.00	0.49	0	0	0									2
592	407	W	71	79	28	3232	3233	0.27	L	5	E	1	0.55	0.00	0.55	0	0	0									3
592	407	W	71	79	28	3233	3234	0.09	L	5	E	1	0.18	0.00	0.18	0	0	0									2
592	407	W	71	79	28	3234	3235	0.22	L	5	E	1	0.45	0.00	0.45	0	0	0									3
592	407	W	71	79	28	3235	3243	0.03	L	5	E	1	0.06	0.00	0.06	0	0	0									2
592	407	W	71	78	13.3	3236	3237	0.08	L	5	E	1	0.16	0.00	0.16	0	0	0									
592	407	W	71	78	13.3	3237	3238	0.04	L	5	E	1	0.08	0.00	0.08	0	0	0									
592	407	W	71	78	13.3	3238	3239	0.06	L	5	E	1	0.12	0.00	0.12	0	0	0									
592	407	W	71	78	13.3	3239	3240	0.14	L	3	E	1	0.31	0.00	0.31	0	0	0									
592	407	W	71	78	13.2	3240	3235	0.27	L	3	E	1	0.59	0.00	0.59	0	0	0									2
592	407	W	71	78	13.2	3241	3242	0.13	L	5	E	1	0.27	0.00	0.27	0	0	0									
592	407	W	71	78	13.2	3242	3240	0.16	L	5	E	1	0.33	0.00	0.33	0	0	0									
592	407	W	71	79	28	3244	3246	0.25	L	5	E	1	0.51	0.00	0.51	0	0	0									
592	406	W	71	79	28	3247	3250	0.63	L	3	E	1	1.37	0.00	1.37	0	0	0									
592	404	W	71	79	12.3	3248	3249	0.13	L	6	E	1	0.32	0.00	0.32	0	0	0									
592	404	W	71	79	12.3	3249	3223	0.09	L	6	E	1	0.22	0.00	0.22	0	0	0									
592	404	W	71	79	28	3250	3251	0.16	L	5	E	1	0.33	0.00	0.33	0	0	0									
592	404	W	71	79	28	3251	3252	0.31	L	6	E	1	0.77	0.00	0.77	0	0	0									1
																											0.09

VCU	Unk	Grp	Road Number			Road Link		Length miles	Road Class		Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variab lity \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xmg	V-Notch xmg		Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from	to		type	haul								const	road const. \$	road reconst. \$						>48" CMP and bridges \$	total \$			
592		W	71	79	28	3253	3254	0.03	L	6	E	1	P	1	0.07	0.00	0.07	4,500	0	0	0	4,500						1		
592	405	W	71	79	28	3254	3255	0.07	L	6	E	1	P	1	0.17	0.00	0.17	10,500	0	0	0	10,500						1		
592	405	W	71	79	28	3255	3256	0.11	L	6	E	1	P	1	0.27	0.00	0.27	16,500	0	0	0	16,500						1		
592	405	W	71	79	28	3256	3259	0.96	L	6	E	1	P	1	2.37	0.00	2.37	144,000	0	0	0	144,000						1		
592	405	W	71	79	12.2	3257	3258	0.05	L	6	E	1	P	1	0.12	0.00	0.12	7,500	0	0	0	7,500	0.05							
592	405	W	71	79	12.2	3258	3256	0.06	L	6	E	1	P	1	0.15	0.00	0.15	9,000	0	0	0	9,000	0.02							
592		W	79	28	28	3260	3262	0.05	L	5	E	1	P	1	0.10	0.00	0.10	7,500	0	0	0	7,500						2		
592	402	W	71	79	7.1	3262	3261	0.18	L	5	E	1	P	1	0.37	0.00	0.37	27,000	0	0	0	27,000						2		
592	401	W	71	79	28	3267	3268	0.05	L	5	E	1	P	1	0.10	0.00	0.10	7,500	0	0	0	7,500						1		
592	401	W	71	79	28	3268	3269	0.11	L	5	E	1	P	1	0.22	0.00	0.22	16,500	0	0	0	16,500						1		
592	401	W	71	79	28	3269	3270	0.09	L	5	E	1	P	1	0.18	0.00	0.18	13,500	0	0	0	13,500						1		
592	401	W	71	79	28	3270	3271	0.06	L	5	E	1	P	1	0.12	0.00	0.12	9,000	0	0	0	9,000						1		
592	401	W	71	79	28	3271	3272	3.13	L	5	E	1	P	1	6.39	0.00	6.39	469,500	0	0	0	469,500	0.03					21		
591	409	W	71	79	28.1	3272	3273	0.14	L	5	E	1	P	1	0.29	0.00	0.29	21,000	0	0	0	21,000						2		
591	409	W	71	79	28.1	3273	3274	0.08	L	5	E	1	P	1	0.16	0.00	0.16	12,000	0	0	0	12,000								
591	409	W	71	79	28.1	3274	3210	0.05	L	5	E	1	P	1	0.10	0.00	0.10	7,500	0	0	0	7,500								
592	402	W	71	79	7.1	3280	3262	0.18	L	5	E	1	P	1	0.37	0.00	0.37	27,000	0	0	0	27,000								
591	405	W	69	81	16.1	3281	3282	0.09	L	5	E	1	P	1	0.18	0.00	0.18	13,500	0	0	0	13,500						2		
591	405	W	69	81	16.1	3282	3283	0.06	L	5	E	1	P	1	0.12	0.00	0.12	9,000	0	0	0	9,000								
591	405	W	69	81	16.1	3283	3284	0.1	L	5	E	1	P	1	0.20	0.00	0.20	15,000	0	0	0	15,000								
591	405	W	69	81	16.1	3284	3284	0.14	L	5	E	1	P	1	0.29	0.00	0.29	21,000	0	0	0	21,000								
591	405	W	69	81	16.1	3284	3207	0.69	L	5	E	1	P	1	1.41	0.00	1.41	103,500	0	0	0	103,500								
591	405	W	69	81	16.2	3284	3284	0.21	L	5	E	1	P	1	0.43	0.00	0.43	31,500	0	0	0	31,500								
593	424	W	71	79	34.3C	5002	5005	0.17	L	5	E	1	P	1	0.35	0.00	0.35	25,500	0	0	0	25,500								
593	424	W	71	79	34.3B	5003	5005	0.09	L	5	E	1	P	1	0.18	0.00	0.18	13,500	0	0	0	13,500								
593	424	W	71	79	34.3	5004	5005	0.45	C	2	E	1	P	1	0.77	0.00	0.77	67,500	0	0	0	67,500								
593	424	W	71	79	34.3	5004	5004	0.13	L	5	E	1	P	1	0.27	0.00	0.27	19,500	0	0	0	19,500								
593	424	W	71	79	34.3A	5006	5007	0.23	L	5	E	1	P	1	0.47	0.00	0.47	34,500	0	0	0	34,500								
593	420	W	71	79	34.3	5012	5013	0.12	C	2	E	1	P	1	0.21	0.00	0.21	18,000	0	0	0	18,000						2		
593	420	W	71	79	34.F	5012	5012	0.08	L	5	E	1	P	1	0.16	0.00	0.16	12,000	0	0	0	12,000								
593	420	W	71	79	34	5015	5014	0.19	L	5	E	1	P	1	0.39	0.00	0.39	28,500	0	0	0	28,500								
593	420	W	71	79	34.D	5015	5015	0.04	L	5	E	1	P	1	0.08	0.00	0.08	6,000	0	0	0	6,000						6		
593	410	W	71	79	34.3	5016	5017	0.38	C	2	E	1	P	1	0.65	0.00	0.65	57,000	0	0	0	57,000	0.07							
593		W	71	79	34.3	5017	5022	0.1	C	2	E	1	P	1	0.17	0.00	0.17	15,000	0	0	0	15,000						2		
593	431	W	72	79	13.1	5018	5019	0.12	L	5	E	1	P	1	0.24	0.00	0.24	18,000	0	0	0	18,000								
593	431	W	71	79	13.1	5019	5020	0.82	L	5	E	1	P	1	1.67	0.00	1.67	123,000	0	0	0	123,000	0.11							
593	410	W	71	79	12.2	5021	5020	0.29	L	5	E	1	P	1	0.59	0.00	0.59	43,500	0	0	0	43,500								
593	408	W	71	79	34F	5026	5022	0.35	L	5	E	1	P	1	0.71	0.00	0.71	52,500	0	0	0	52,500								
593		W	71	79	34.3	5027	5038	0.82	C	2	E	1	P	1	1.40	0.00	1.40	123,000	0	50,000	0	173,000			1			5		
593	417	W	72	79	2	5028	5030	0.54	L	4	E	1	P	1	1.64	0.00	1.64	81,000	0	0	0	81,000	0.04					6		
593	402	W	72	79	11.2	5029	5030	0.19	L	6	E	1	P	1	0.47	0.00	0.47	28,500	0	0	0	28,500	0.13					7		
593		W	72	79	12.4	5034	5032	0.45	L	5	E	1	P	1	0.92	0.00	0.92	67,500	0	0	0	67,500	0.12			1		3		
593	418	W	72	79	11.1	5035	5034	0.23	L	5	E	1	P	1	0.47	0.00	0.47	34,500	0	9,400	0	43,900			1			1		
593	409	W	72	79	11.5	5036	5027	0.34	L	5	E	1	P	1	0.69	0.00	0.69	51,000	0	0	0	51,000						1		
593	409	W	72	79	11.5	5037	5036	0.08	L	5	E	1	P	1	0.16	0.00	0.16	12,000	0	0	0	12,000						1		
593		W	71	79	34.3	5038	5040	0.41	C	2	E	1	P	1	0.70	0.00	0.70	61,500	0	0	0	61,500						1		
593		W	71	79	34.2	5040	5052	1.2	C	2	E	1	P	1	2.05	0.00	2.05	180,000	0	4,700	0	184,700			1			3		
593	422	W	71	79	34.2	5041	5042	0.51	L	5	E	1	P	1	1.04	0.00	1.04	76,500	0	0	0	76,500						2		
593	422	W	71	79	34.2	5043	5044	0.06	L	5	E	1	P	1	0.12	0.00	0.12	9,000	0	0	0	9,000						1		
593	419	W	71	79	14.3	5045	5045	0.07	L	5	E	1	P	1	0.14	0.00	0.14	10,500	0	0	0	10,500								
593	419	W	71	79	14.4	5045	5045	0.07	L	5	E	1	P	1	0.14	0.00	0.14	10,500	0	0	0	10,500								
593	419	W	71	79	14.2	5045	5045	0.05	L	5	E	1	P																	

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Traffic Srvy Level	Road Mnth. Level	Acc- Man.	1=EASY 2=MED 3=DIFF 4=REC 5=PRIV	Variab \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs			Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing		Other Strm xings	Unstb Soils miles	Switch backs no.
			T	R	S	from	to										road const. \$	road reconst. \$	> 48" CMP and bridges \$					#	diff			
593	419	W	71	79	14.5	5046	5045	0.07	L	D	1	P	1	0.14	0.00	0.14	10,500	0	0	10,500								
593	419	W	71	79	14.1	5046	5046	0.03	L	D	1	P	1	0.06	0.00	0.06	4,500	0	0	4,500								
593	426	W	72	79	27.1	5047	5048	0.1	L	D	1	P	1	0.20	0.00	0.20	15,000	0	0	15,000						4		
593	426	W	72	79	27.1	5048	5061	0.49	L	D	1	P	1	1.00	0.00	1.00	73,500	0	0	73,500								
593	430	W	72	79	14	5049	5051	0.05	L	D	1	P	1	0.10	0.00	0.10	7,500	0	0	7,500								
593	430	W	72	79	14	5050	5049	0.14	L	D	1	P	1	0.29	0.00	0.29	21,000	0	0	21,000								
593	430	W	72	79	14	5051	5042	0.8	L	D	1	P	1	1.63	0.00	1.63	120,000	0	0	120,000						4		
593	418	W	72	79	1.1	5059	5035	0.09	L	D	1	P	1	0.18	0.00	0.18	13,500	0	0	13,500	0.05					1		
593	422	W	71	79	24.2	5060	5043	0.16	L	D	1	P	1	0.33	0.00	0.33	24,000	0	0	24,000								
593	422	W	72	79	27	5061	5049	0.89	L	D	1	P	1	2.71	0.00	2.71	133,500	0	50,000	183,500	0.05	1				5		
593	417	W	72	79	2.1	5064	5028	0.07	L	D	1	P	1	0.21	0.00	0.21	10,500	0	0	10,500						1		
593	417	W	72	79	2	5065	5028	0.07	L	D	1	P	1	0.21	0.00	0.21	10,500	0	0	10,500								
593	417	W	72	79	11.5	5065	5037	0.11	L	D	1	P	1	0.22	0.00	0.22	16,500	0	0	16,500								
593	410	W	72	79	12.2	5066	5021	0.11	L	D	1	P	1	0.22	0.00	0.22	16,500	0	0	16,500								
593	410	W	72	79	12.2	5067	5021	0.07	L	D	1	P	1	0.21	0.00	0.21	10,500	0	0	10,500								
593	408	W	71	79	34.D	5069	5023	0.04	L	D	1	P	1	0.08	0.00	0.08	6,000	0	0	6,000								
593	408	W	71	79	34.F	5070	5025	0.23	L	D	1	P	1	0.70	0.00	0.70	34,500	0	0	34,500						1		
593	408	W	71	79	34.F	5071	5024	0.08	L	D	1	P	1	0.24	0.00	0.24	12,000	0	0	12,000								
593	431	W	71	79	13.2	5073	5018	0.09	L	D	1	P	1	0.18	0.00	0.18	13,500	0	0	13,500								
593	431	W	71	79	13.2	5074	5018	0.14	L	D	1	P	1	0.29	0.00	0.29	21,000	0	0	21,000								
593	426	W	71	79	27.1	5075	5047	0.16	L	D	1	P	1	0.49	0.00	0.49	24,000	0	0	24,000								
593	422	W	72	79	24.1	5077	5041	0.19	L	D	1	P	1	0.39	0.00	0.39	28,500	0	0	28,500								
593	422	W	72	79	24.3	5078	5044	0.1	L	D	1	P	1	0.20	0.00	0.20	15,000	0	0	15,000								
593	420	W	71	79	34.D	5079	5015	0.06	L	D	1	P	1	0.12	0.00	0.12	9,000	0	0	9,000						1		
592	426	W	72	79	28	9504	9503	0.32	C	D	2	P	1	0.55	0.00	0.55	48,000	0	0	48,000						1		
593	426	W	72	79	27.3	9614	5048	0.48	L	D	1	P	1	0.98	0.00	0.98	72,000	0	0	72,000								
593	424	W	71	79	34.3D	9615	5002	0.06	L	D	1	P	1	0.12	0.00	0.12	9,000	0	0	9,000								
593	424	W	71	79	34	501	50	0.39	C	D	2	P	2	0.67	0.00	0.67	78,000	0	0	78,000						3		
594	413	W	71	80	30	3213	3213	0.15	L	D	1	A	2	0.37	0.00	0.37	30,000	0	0	30,000						3		
594	413	W	71	80	30	3214	9201	0.39	L	D	1	A	2	0.96	0.00	0.96	78,000	0	0	78,000						8		
594	413	W	71	80	27.1	3216	3215	0.4	L	D	1	A	2	0.99	0.00	0.99	80,000	0	0	80,000	0.11	1				6		
592	424	W	71	79	28	3261	9504	0.24	C	D	2	P	2	0.41	0.00	0.41	48,000	0	0	48,000						1		
593	424	W	71	79	34.3	5005	5007	0.09	C	D	2	P	2	0.15	0.00	0.15	18,000	0	0	18,000								
593	421	W	71	79	34.3	5007	5008	0.8	C	D	2	P	2	1.37	0.00	1.37	160,000	0	0	160,000						5		
593	421	W	72	79	24	5009	5012	0.42	C	D	2	P	2	0.72	0.00	0.72	84,000	0	0	84,000	0.17					7		
593	421	W	72	79	24	5010	5011	0.42	L	D	1	P	2	1.04	0.00	1.04	84,000	0	0	84,000	0.07					1		
593	421	W	72	79	24	5011	5008	0.4	L	D	1	P	2	0.74	0.00	0.74	60,000	0	0	60,000	0.07					1		
593	420	W	71	79	34.3	5013	5014	0.51	C	D	2	P	2	0.99	0.00	0.99	80,000	0	0	80,000	0.07					5		
593	420	W	71	79	34.3	5014	5016	0.48	C	D	2	P	2	0.82	0.00	0.82	102,000	0	0	102,000	0.31					7		
593	420	W	71	79	12.1	5020	5017	0.53	L	D	1	P	2	1.31	0.00	1.31	106,000	0	0	106,000						5		
593	408	W	71	79	34.3	5022	5027	0.46	C	D	2	P	2	0.79	0.00	0.79	92,000	0	0	92,000	0.17					4		
593	408	W	71	79	34D	5023	5026	0.19	L	D	1	P	2	0.58	0.00	0.58	38,000	0	0	38,000								
593	408	W	71	79	34E	5024	5026	0.09	L	D	1	P	2	0.27	0.00	0.27	18,000	0	0	18,000								
593	408	W	71	79	34F	5025	5026	0.09	L	D	1	P	2	0.27	0.00	0.27	18,000	0	0	18,000								
593	402	W	72	79	11.2	5030	5031	0.28	L	D	1	P	2	0.69	0.00	0.69	56,000	0	0	56,000	0.17					6		
593	402	W	72	79	11.2	5031	5032	0.33	L	D	1	P	2	0.67	0.00	0.67	66,000	0	0	66,000	0.03					4		
593	401	W	79	79	12.4	5033	5034	0.66	L	D	1	P	2	1.35	0.00	1.35	132,000	0	0	132,000	0.08					7		
593	406	W	72	79	11.3	5039	5038	0.28	L	D	1	P	2	0.57	0.00	0.57	56,000	0	0	56,000	0.06					5		
593	422	W	71	79	34.2	5042	5043	0.35	L	D	1	P	2	0.71	0.00	0.71	70,000	0	0	70,000	0.09					4		
593	422	W	71	79	34.2	5044	5046	0.7	L	D	1	P	2	1.43	0.00	1.43	140,000	0	0	140,000	0.02					6		

Road Information
(Grouped by Area and LTF)

VCU	Unit	Grp	Road Number			Road Link		Length miles	Road Class type	Traffic Serv Level	Road Main Level	Acc- ess Man.	1=EASY 2=MED 3=DIFF 4=RECN 5=PRIV	Variabl \$/mbf	Native Rd \$/mbf	Total Var \$/mbf	Fixed Costs				Grade > 12% miles	Slope > 55% miles	Bridge	CMP > 48"	TTRA xing	V-Notch xing		Other Strm xings	Unstb Soils miles	Switch backs no.	
			T	R	S	from	to										haul	const	road const.	road reconst.						>48" CMP and bridges	total \$				#
593	419	W	71	79	34.2	5045	5045	L	5	M	D	1	2	0.47	0.00	0.47	46,000	0	4,700	50,700	0.09			1		1	D	1			
593	419	W	71	79	34.2	5045	5046	L	5	M	D	1	2	2.02	0.00	2.02	198,000	0	4,700	202,700				1		1	D	4			
593	422	W	71	79	34.2	5046	5045	L	5	M	D	1	2	0.20	0.00	0.20	20,000	0	0	20,000								1			
593		W	71	79	34.2	5046	5040	C	2	M	C	1	2	1.81	0.00	1.81	212,000	0	0	212,000	0.05	0.09						8			
593		W	71	79	34.1	5052	50.1	C	2	M	C	2	2	2.10	0.00	2.10	246,000	0	4,700	250,700				1		1		2			
593	407	W	71	79	34.1	5053	9400	L	5	M	D	1	2	0.41	0.00	0.41	40,000	0	0	40,000											
593	407	W	72	79	10.1	5054	5055	L	6	M	D	1	2	0.67	0.00	0.67	54,000	0	0	54,000											
593	403	W	71	79	34.1	5058	5052	L	6	M	D	1	2	1.01	0.00	1.01	82,000	0	0	82,000	0.05					1		7			
593	403	W	71	79	34A	5058	5058	L	5	M	D	1	2	1.63	0.00	1.63	160,000	0	0	160,000								1			
593	401	W	72	79	12.4	5062	5033	L	5	M	D	1	2	0.16	0.00	0.16	16,000	0	0	16,000								2			
593	408	W	71	79	34.C	5068	5023	L	4	M	D	1	2	0.27	0.00	0.27	18,000	0	0	18,000	0.04							4			
594		W	71	80	30	9201	3213	L	6	M	D	1	2	0.59	0.00	0.59	48,000	0	0	48,000											
593		W	71	79	34.7	9400	5040	L	5	M	D	1	2	0.41	0.00	0.41	40,000	0	0	40,000								1			
592		W	71	79	28	9500	3267	C	1	M	C	2	2	0.22	0.00	0.22	16,000	0	0	16,000	0.08							1			
592		W	71	79	28	9502	9500	C	1	M	C	2	2	1.87	0.00	1.87	136,000	0	0	136,000	0.34							1			
592		W	71	79	28	9503	9502	C	1	M	C	2	2	0.50	0.00	0.50	36,000	0	0	36,000	0.18							1			
592		W	71	79	28	3243	3244	L	6	D	1	3	3	0.42	0.00	0.42	51,000	0	0	51,000	0.14	0.09					2				
592	406	W	71	79	28	3246	3247	L	5	D	1	3	3	0.27	0.00	0.27	39,000	0	0	39,000								1			
592		W	71	79	28	3252	3253	L	6	D	1	3	3	0.25	0.00	0.25	30,000	0	0	30,000								1			
592		W	71	79	28	3259	3260	L	5	D	1	3	3	0.16	0.00	0.16	24,000	0	50,000	74,000			1				2				
593	407	W	71	79	34.1	5053	5053	L	5	D	1	3	3	0.16	0.00	0.16	24,000	0	0	24,000	0.06							2			
593	407	W	71	79	34.1	5055	5053	L	5	D	1	3	3	0.16	0.00	0.16	24,000	0	0	24,000								3			
593	402	W	72	79	11.2	5063	5029	L	6	D	1	3	3	0.67	0.00	0.67	81,000	0	0	81,000	0.13	0.03					7				
Winter Harbor Group Road Construction																8,250,500	0	401,700	8,652,200	3.51	0.99	7	11	13	14	0	346	0	4		
Winter Harbor Road Reconstruction And Bridge Replace																0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Winter Harbor Group Road Totals																8,250,500	0	401,700	8,652,200	3.51	0.99	7	11	13	14	0	346	0	4		
																48.70 miles															

Alternative 2 Totals

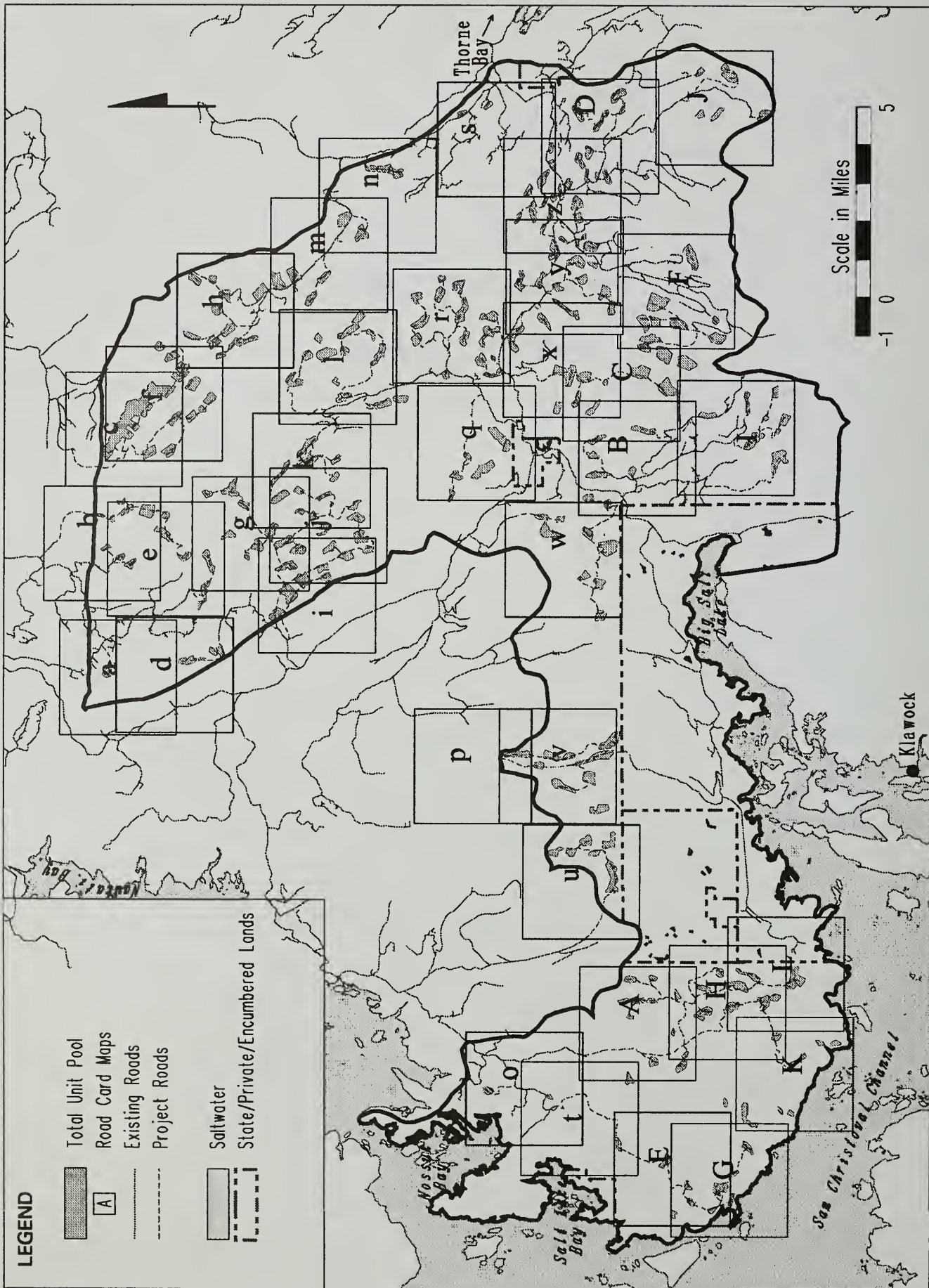
Parameters - 1 Year															
Road Construction	218.4	36,419,000	0	1,535,400	37,954,400	16.80	7.39	23	82	58	68	0	1,449	5	31
Road Reconstruction And Bridge Replacement	8.05	0	161,000	350,000	511,000	0.00	0.00	7	0	0	0	0	0	0	0
Private Road Use	10.91	0	0	15,000	0.00	0.00	0.00	0	0	0	0	0	0	0	0
Road Totals	237.31	36,419,000	161,000	1,885,400	38,480,400	16.80	7.39	30	82	58	68	0	1,449	5	31
															237.31 miles

Appendix G

Road Design Cards

ROAD DESIGN CARDS

CONTROL LAKE EIS



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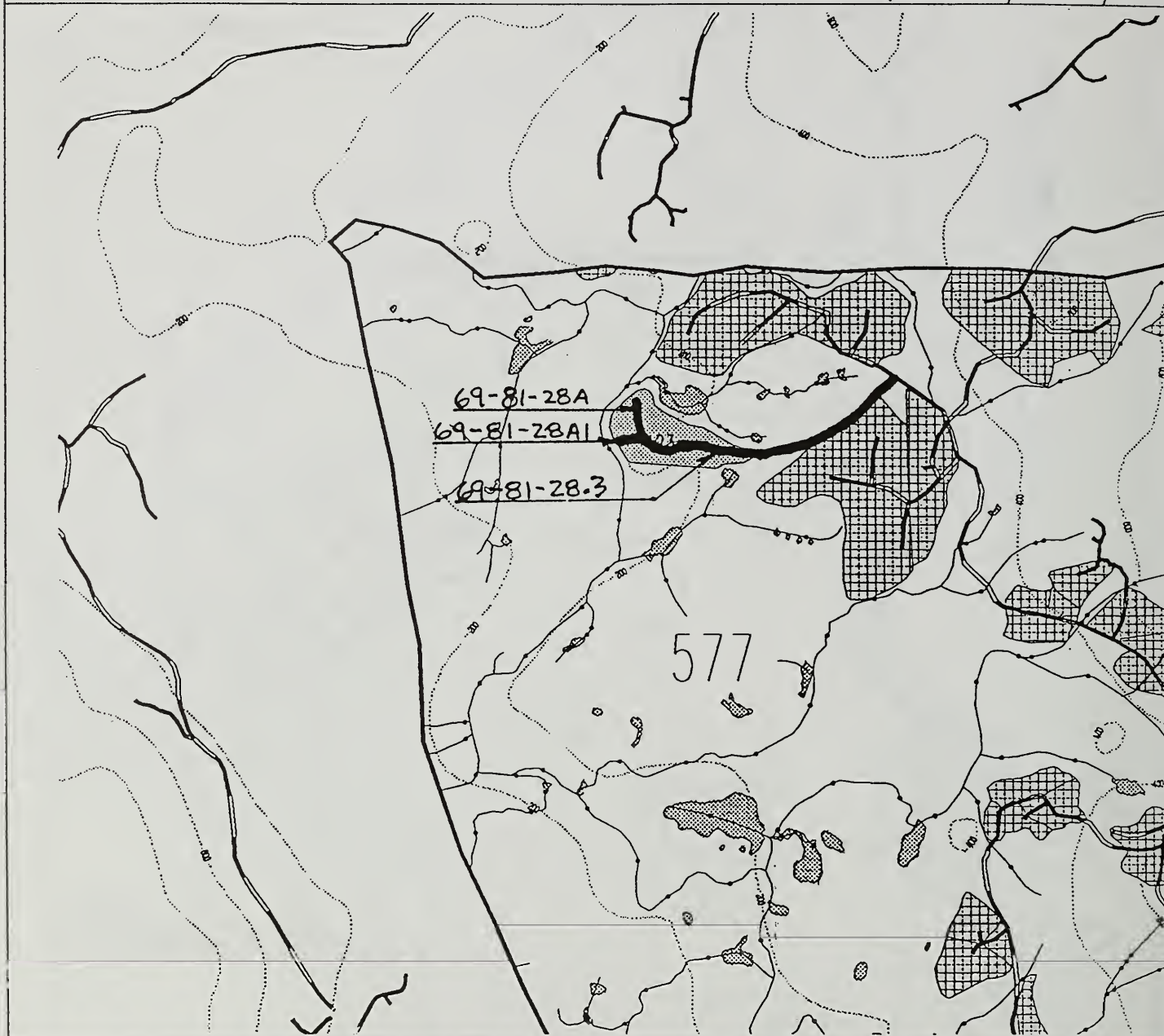
CONTROL LAKE PROJECT ROAD DESIGN CARD

"a"

ROAD : ?

VCU : 577

QUAD : D3NW/SW-D4NE/SE



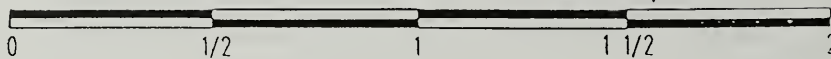
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square "a"

MAIN ROAD #: 69-81-28.3		VCU: 577	TOTAL LENGTH: 6875 FEET
ROAD CLASS: Local		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 0 _____ - CLASS II: _____ 0 _____			
Engineering	Field Review: K. Martin, B. Flatz		Office Review: J. Doyal, K. Martin
<p><u>Main Road:</u> Length: 5350'; Construction: 76% Easy, 24% Medium, 0% Difficult; # of >48" Culverts 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 0; # of "V" Notches: 0; Units Accessed: 577-423; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0. <u>Spurs:</u> Road #: 69-81-28A, Length: 1035, Construction type: easy Road #: 69-81-28A1, Length: 490', Construction type: easy Comments: The IDT decided not to harvest the south 1/2 of unit 577-423. Therefore, the last 1000' of the main road (but included in the length above) will not have to be constructed for this entry.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

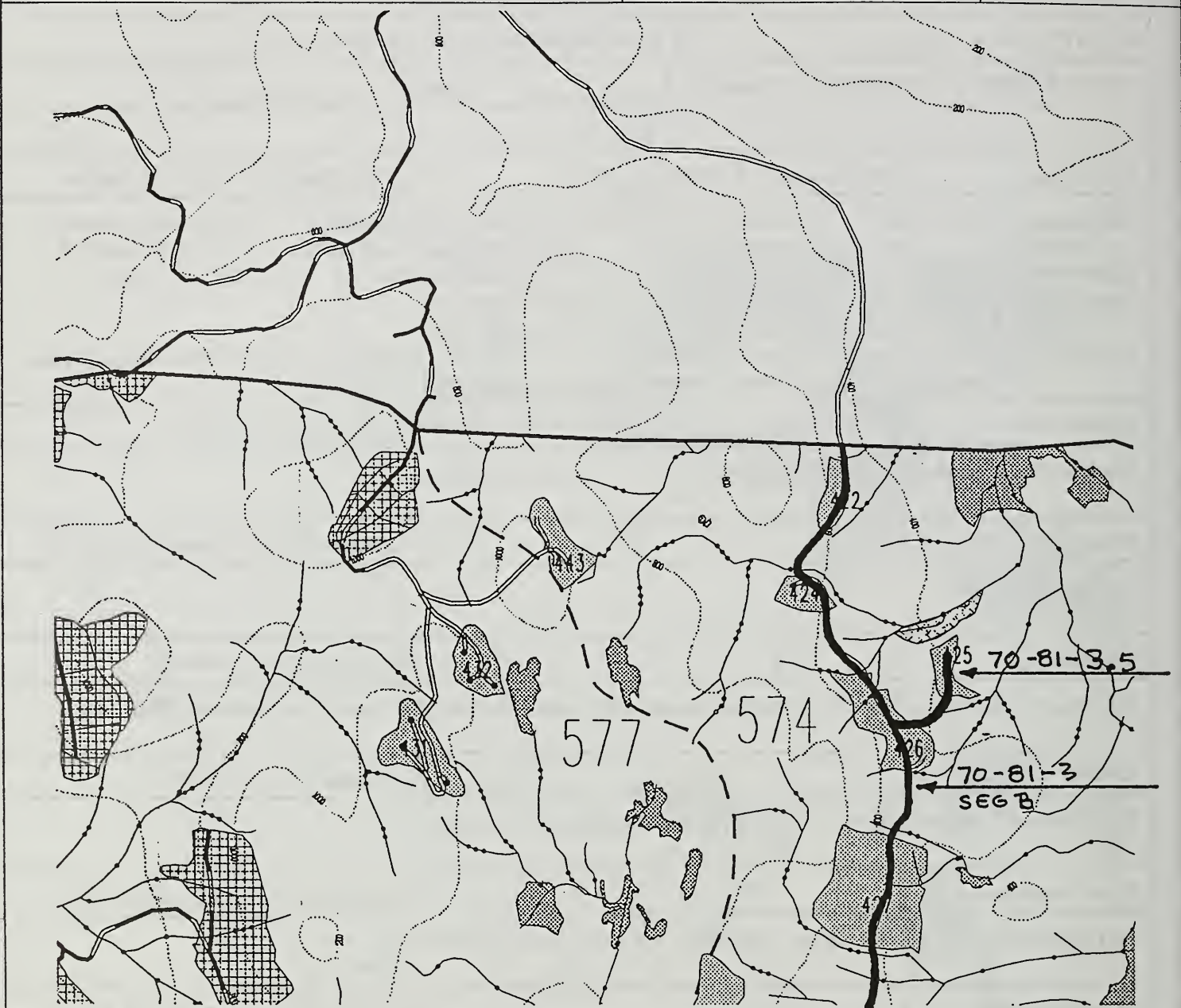
CONTROL LAKE PROJECT ROAD DESIGN CARD

"b"

ROAD : 69-81

VCU : 574/577

QUAD : D3NW/SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

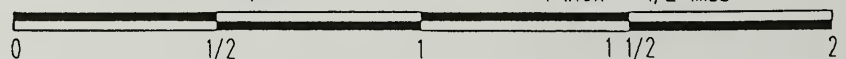
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "b"

MAIN ROAD #: 69-81-26.7		VCU: 577	TOTAL LENGTH: 4930 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 0 _____ - CLASS II: _____ 1 _____			
Engineering	Field Review: K. Marin, B. Flatz, D. Keister		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 3930'; Construction: 28% Easy, 66% Medium, 6% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 830'; # of "V" Notches: 0; Units Accessed: 577-431; # of Quarry Sites: 1; # of Switchbacks: 1; Ft. of Critical Grades: 480'. <u>Spurs:</u> Road #: 69-81-26.8, Length: 800', Construction type: easy Road #: 69-81-26.9, Length: 200', Construction type: easy Comments: The original road grade on the original paper plan came from an existing USFS road from the southwest. That location was attempted but not used due to extensive slide activity in that area.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review:		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "b"

MAIN ROAD #: 70-81-3 (Seg. B)		VCU: 574 & 577	TOTAL LENGTH: 15106 FEET
ROAD CLASS: collector		SERVICE LEVEL: B	
MAINTENANCE LEVEL: 3		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 1 _____ - CLASS II: _____ 5 _____			
Engineering	Field Review: J. Doyal, J. Herzberg, J.Graves		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 12577'; Construction: 96% Easy, 4% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 234'; # of "V" Notches: 0; Units Accessed: 5 units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1149'</p> <p><u>Spurs:</u> Road #: 70-81-3.6, Length: 150', Construction type: easy (unit 574-424) Road #: 70-81-3.5, Length: 1600', Construction type: easy (unit 574-425) Road #: 70-81-3.3, Length: 265', Construction type: easy (unit 574-426) Road #: 70-81-3.2, Length: 514', Construction type: easy (unit 574-427)</p> <p><u>Comments:</u> The haul direction may be reversed on this road segment, because the 3 segments of this road form a loop and will be analyzed to determine the best haul route. The segment of the road which goes north from 574-422 is not field verified.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
<p>Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).</p>			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
<p>Segment of the road for unit 574-422 will not be visible from a Priority Travel Route/Use Area. Other segments are within "Thorne River/Honker Canoe Route" Viewshed Retention VQO. Should not be apparent to casual Forest visitor Middleground Distance Zone.</p>			
Other Resources	Field Review:		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "b"

MAIN ROAD #: 69-81-26		VCU: 577 & 574	TOTAL LENGTH: 3538 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 0 _____ - CLASS II: _____ 1 _____			
Engineering	Field Review: B. Flatz, B. Wilkinson		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 3090'; Construction: 97% Easy, 3% Medium, 00% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 1974'; # of "V" Notches: 0; Units Accessed: 577-443; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 255'. <u>Spurs:</u> Road #: 69-81-26.2, Length: 448', Construction type: easy Comments: This is a road that is primarily easy construction. Sideslopes are 0-25%. Note that although a large portion of the road is in muskeg, very little rock was encountered. Look for a good rock source during final layout.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review: .		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "b"

MAIN ROAD #: 69-81-26.1		VCU: 577	TOTAL LENGTH: 4064 FEET
ROAD CLASS: Local		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____0____ - CLASS II: ____0____			
Engineering	Field Review: E. Urstadt, J. Herzberg		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 3590'; Construction: 95% Easy, 5% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 166'; Ft. of Muskeg Crossing: 1218'; # of "V" Notches: 0; Units Accessed: 577-431,432,443 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 166'. <u>Spurs:</u> Road #: 69-81-26.1A Length: 275', Construction type: Easy Road #: 69-81-26.1B Length: 199', Construction type: Easy Comments: This road system will access lakes in the area. Before final layout, see the 577-432 unit folder for an alternate location for the portion of the road within that unit.</p>			
Timber/Silviculture			Comments by: J. Boyce -
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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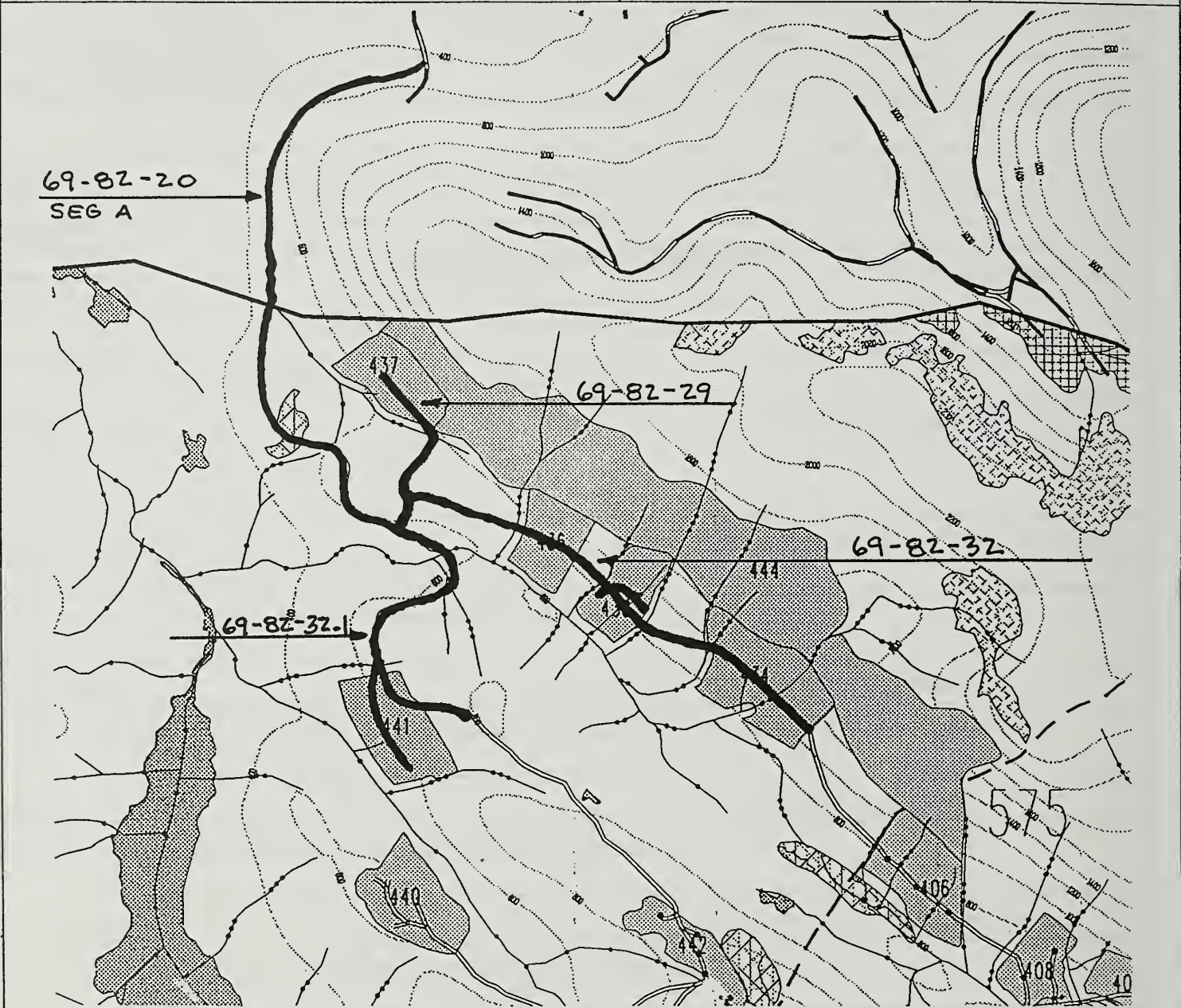
CONTROL LAKE PROJECT ROAD DESIGN CARD

"C"

ROAD : 69-82

VCU : 574/575

QUAD : D3SE/SW



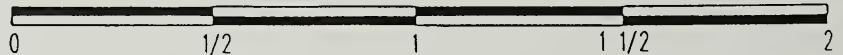
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

Padayappa

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "c"

MAIN ROAD #: 69-82-20 (Seg. A)		VCU: 574	TOTAL LENGTH: 19476 FEET
ROAD CLASS: collector		SERVICE LEVEL: B,C	
MAINTENANCE LEVEL: 3		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>			
Engineering	Field Review: M. Whitty, J Graves		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 17116'; Construction: 66% Easy, 28% Medium, 6% Difficult; # of >48" Culverts: 1; # of Bridges: 2; Ft. of Cross Slopes >55%: 705'; Ft. of Muskeg Crossing: 262'; # of "V" Notches: 0; Units Accessed: SEVERAL; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 169'. <u>Spurs:</u> Road #: 69-82-32.1, Length: 2360', Construction type: EASY (unit 574-441) Comments: The beginning of this road is part of a loop which will be analyzed for the final haul direction. The end of this road will access 6 units. The spur accesses unit 574-441 only. The bridges were selected over large culverts since they would best protect the fish-bearing streams that were crossed. The quarry sites are rock that was encountered in the area of steep cross slopes.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Segment for unit 574-440 is within "Thorne River/Honker Canoe Route" Viewshed. Retention VQO. Should not be apparent to casual Forest visitor. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "c"

MAIN ROAD #: 69-82-32		VCU: 574	TOTAL LENGTH: 13330 FEET
ROAD CLASS: collector, local		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 1 _____ - CLASS II: _____ 1 _____			
Engineering	Field Review: K. Martin, B. Flatz		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 5620'; Construction: 95% Easy, 5% Medium, 0% Difficult; # of >48" Culverts: 2; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 0; # of "V" Notches: 1; Units Accessed: 4 or more # of Quarry Sites: 0; # of Switchbacks: 1; Ft. of Critical Grades: 201'. <u>Spurs:</u> Road #: 69-82-29, Length: 2850', Construction type: easy (unit 574-437) Road #: 69-82-32.A, Length: 885', Construction type: medium (unit 574-435) Road #: 69-82-32.B, Length: 245', Construction type: easy (unit 574-435) Road #: 69-82-32.5, Length: 3730', Construction type: easy, medium Comments: The main road along with spur 69-82-32.5 is part of a loop and will be analyzed for final haul route. Spur 69-82-32.5 has a 50' wide creek crossing. Spur # 69-82-22 accesses only unit 574-437. This road system accesses very good timber.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Note, other road segments that provide access to this area require fish timing construction windows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "c"

MAIN ROAD #: 69-82-20 (Seg. A)		VCU: 574	TOTAL LENGTH: 19476 FEET
ROAD CLASS: collector		SERVICE LEVEL: B,C	
MAINTENANCE LEVEL: 3		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>			
Engineering			
Field Review: M. Whitty, J Graves		Office Review: E. Urstadt	
<p><u>Main Road:</u> Length: 17116'; Construction: 66% Easy, 28% Medium, 6% Difficult; # of >48" Culverts: 1; # of Bridges: 2; Ft. of Cross Slopes >55%: 705'; Ft. of Muskeg Crossing: 262'; # of "V" Notches: 0; Units Accessed: SEVERAL; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 169'. <u>Spurs:</u> Road #: 69-82-32.1, Length: 2360', Construction type: EASY (unit 574-441) Comments: The beginning of this road is part of a loop which will be analyzed for the final haul direction. The end of this road will access 6 units. The spur accesses unit 574-441 only. The bridges were selected over large culverts since they would best protect the fish-bearing streams that were crossed. The quarry sites are rock that was encountered in the area of steep cross slopes.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology		Comments by: T. Stewart	
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
Segment for unit 574-440 is within "Thorne River/Honker Canoe Route" Viewshed. Retention VQO. Should not be apparent to casual Forest visitor. Middleground Distance Zone.			
Other Resources		Comments by: W. Greiser/M. Greenig	
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

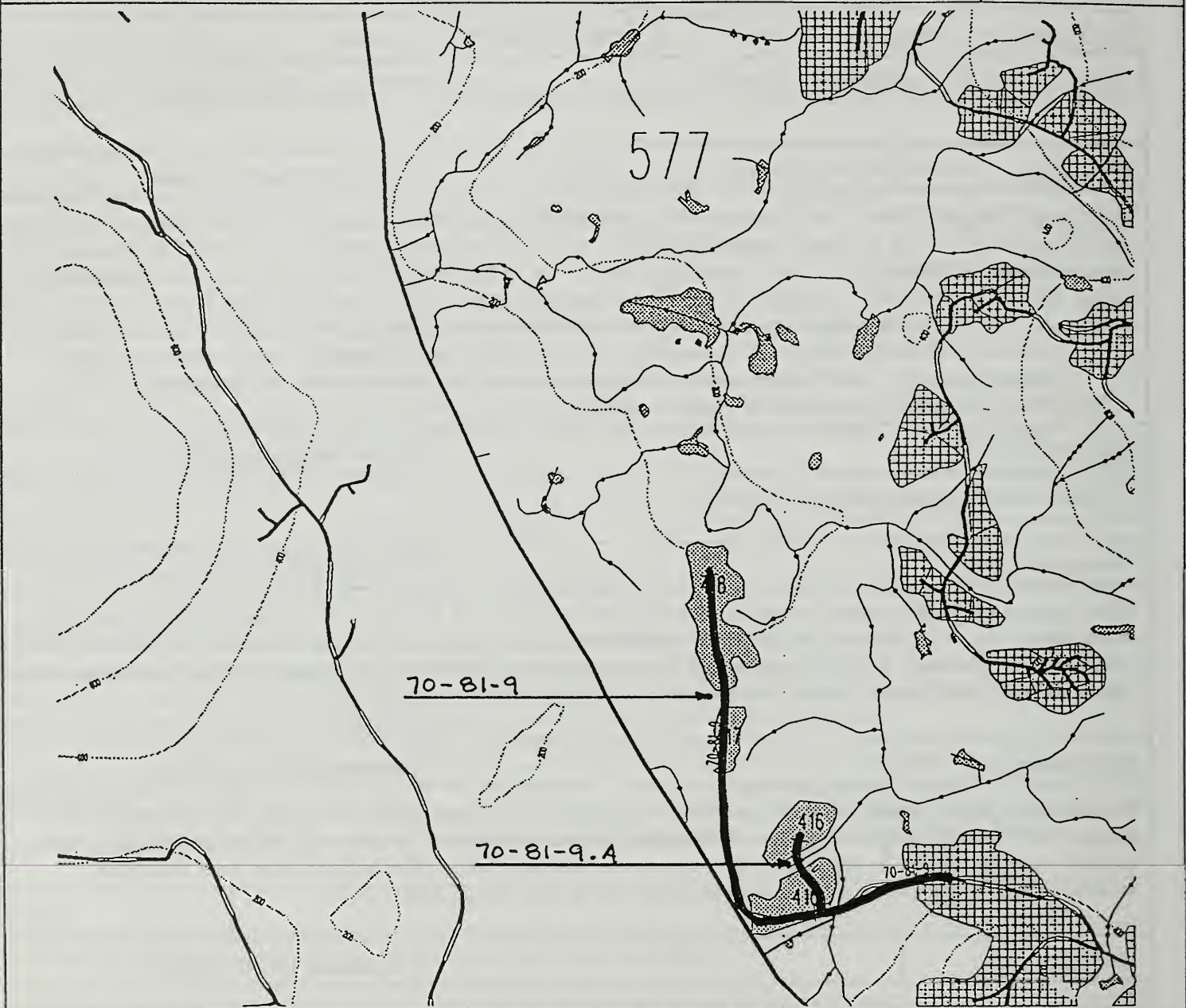
CONTROL LAKE PROJECT ROAD DESIGN CARD

"d"

ROAD : 70-81

VCU : 577

QUAD : D3SW/D4SE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

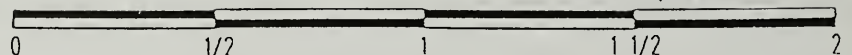
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

Revised

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "d"

MAIN ROAD #: 70-81-9		VCU: 577	TOTAL LENGTH: 11430 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>			
Engineering	Field Review: T. Wetzel, G. Slawson		Office Review: C. Barnhart
<p><u>Main Road:</u> Length: 9610'; Construction: 97% Easy, 3% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1350'; # of "V" Notches: 1; Units Accessed: 3-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 70-81-9.A, Length: 1820', Construction type: easy (unit 577-416) Comments: Construction is very easy with the average cross slopes being 5-15%. The road could be used to access a large lake to the west.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - No cultural resources encountered along portions of road within unit 577-418. Remainder of road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "d"

MAIN ROAD #: 70-81-9		VCU: 577	TOTAL LENGTH: 11430 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ - CLASS II: _____			
Engineering	Field Review: T. Wetzel, G. Slawson		Office Review: C. Barnhart
<p><u>Main Road:</u> Length: 9610'; Construction: 97% Easy, 3% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1350'; # of "V" Notches: 1; Units Accessed: 3-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 70-81-9.A, Length: 1820', Construction type: easy (unit 577-416) Comments: Construction is very easy with the average cross slopes being 5-15%. The road could be used to access a large lake to the west.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - No cultural resources encountered along portions of road within unit 577-418. Remainder of road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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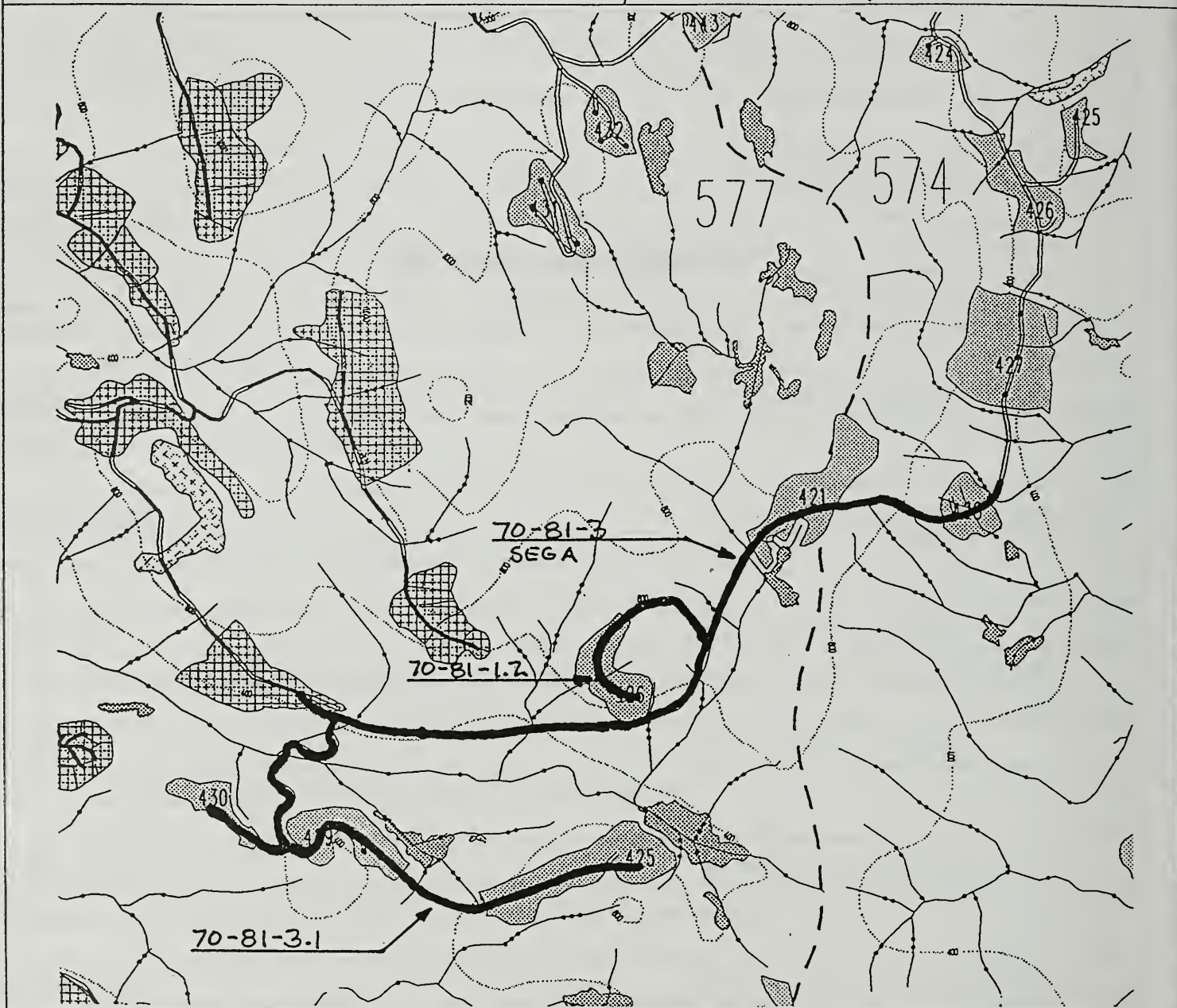
CONTROL LAKE PROJECT ROAD DESIGN CARD

"e"

ROAD : 70-81

VCU : 574/577

QUAD : D3SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

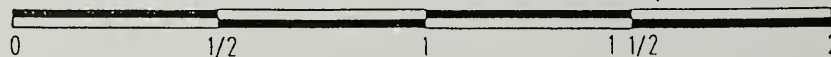
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "e"

MAIN ROAD #: 70-81-3 (Seg. A)		VCU: 574 & 577	TOTAL LENGTH: 17634 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>4</u> - CLASS II: <u>3</u>			
Engineering	Field Review: S. Fields, B. Flatz		Office Review: E. Urstadt, K. Jehnke
<p><u>Main Road:</u> Length: 13528'; Construction: 94% Easy, 6% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 347'; # of "V" Notches: 0; Units Accessed: 3 units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0. <u>Spurs:</u> Road #: 70-81-1.2, Length: 3540', Construction type: medium (unit 577-426) Road #: 70-81-3.1, Length: 566', Construction type: easy (unit 577-428) Comments: The middle unit on this road segment contains poor timber, which is typical of this area. Because of that, this road contains alot of construction per Mbf of timber accessed. This segment is part of a loop that is to be analyzed for the best haul route.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows. Note, other road segments that provide access to this area require fish timing construction windows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "e"

MAIN ROAD #: 70-81-3.1		VCU: 577	TOTAL LENGTH: 9130 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ 0 _____ - CLASS II: _____ 1 _____			
Engineering	Field Review: T. Wetzel, D. Foster		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 9130'; Construction: 40% Easy, 59% Medium, 1% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 700'; # of "V" Notches: 0; Units Accessed: 577-425,429,430; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 1275'. <u>Spurs:</u> none Comments: Note that a spur to unit 577-430 was flagged into the unit but work on it was halted due to the lack of merchantable timber in the unit. No data is available for that spur. This road can provide access to two lakes. The road has moderate construction and ground slopes average 20%.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Note, other road segments that provide access to this area require fish timing construction windows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review:		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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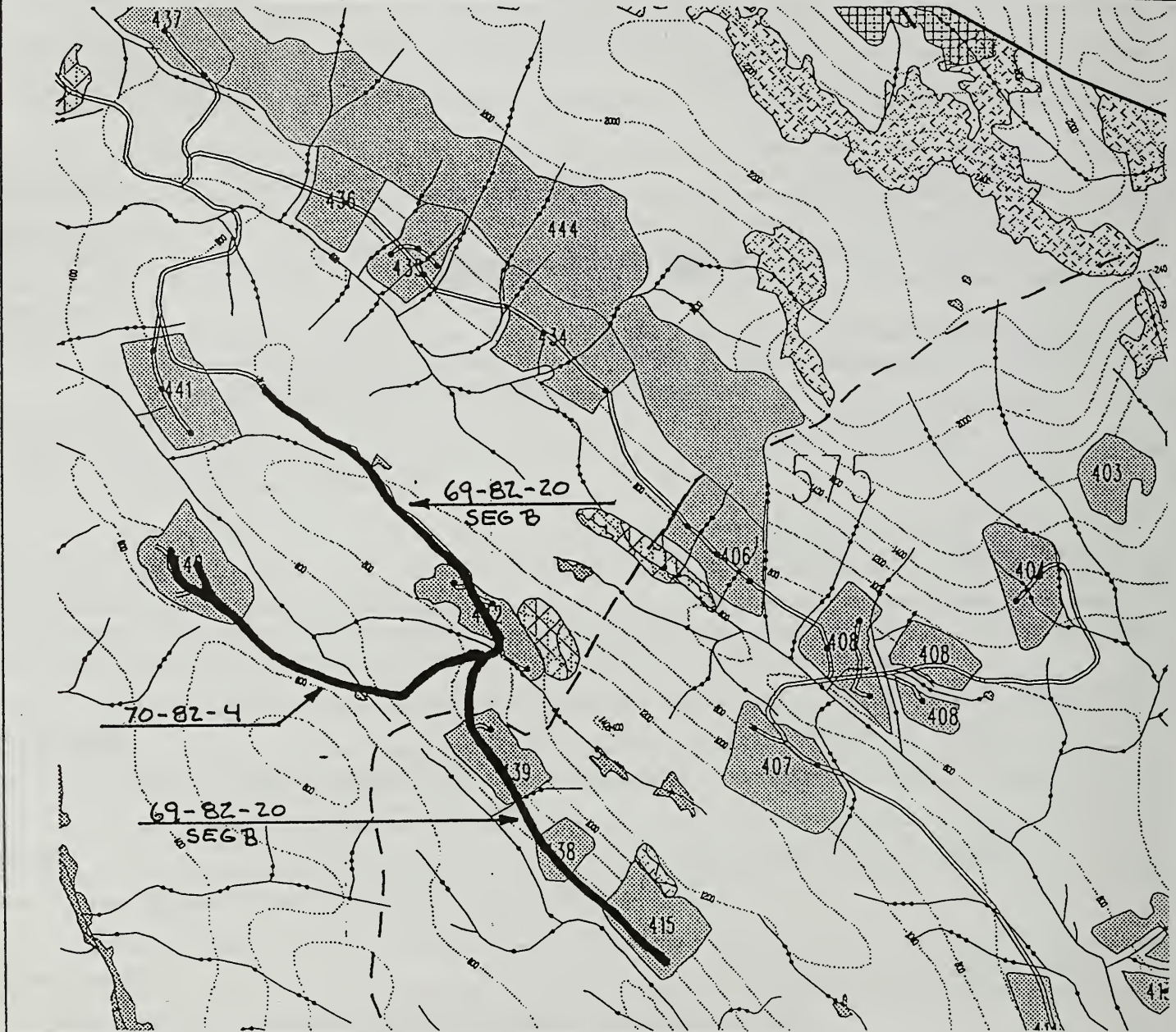
CONTROL LAKE PROJECT ROAD DESIGN CARD

"f"

ROAD : 70-82

VCU : 574/575

QUAD : D3SE/SW



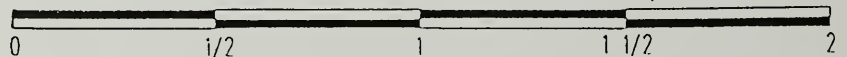
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet --

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "f"

MAIN ROAD #: 69-82-20 (Seg. B)		VCU: 574 & 575	TOTAL LENGTH: 14853 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: S. Field, D. Keister		Office Review: E. Urstadt
<p><u>Main Road</u>: Length: 13693'; Construction: 88% Easy, 9% Medium, 3% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 872'; Ft. of Muskeg Crossing: 1188'; # of "V" Notches: 0; Units Accessed: 4 units; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 0. <u>Spurs</u>: Road #: 70-82-4.1, Length: 547', Construction type: easy (unit 574-442) Road #: 70-82-4.2, Length: 238', Construction type: easy (unit 574-442) Road #: 70-82-4.3, Length: 375', Construction type: easy (unit 574-442) Comments: This road system provides access to Honker Divide. The three spurs are associated with unit 575-442. Construction is basically easy and there is no major stream crossings. The road system accesses good timber.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
<p>Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Segment to unit 575-439 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.</p>			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review:		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "1"

MAIN ROAD #: 70-82-4		VCU: 574	TOTAL LENGTH: 7544 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>0</u>			
Engineering			
Field Review: J. Doyal, J. Herzberg		Office Review: E. Urstadt	
<p><u>Main Road</u>: Length: 6901'; Construction: 98% Easy, 2% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 539'; # of "V" Notches: 0; Units Accessed: 574-440; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 539'. <u>Spurs</u>: Road #: 70-82-4.4, Length: 100', Construction type: easy (unit 574-440) Road #: 70-82-5.1, Length: 330', Construction type: easy (unit 574-440) Road #: 70-82-5.3, Length: 213', Construction type: easy (unit 574-440) Comments: This road has approximately 3500' of 10-15% adverse grades.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
Segment for unit 574-441 is within "Thorne River/Honker Canoe Route" Viewshed. Retention VQO. Should not be apparent to casual Forest visitor. Middleground Distance Zone.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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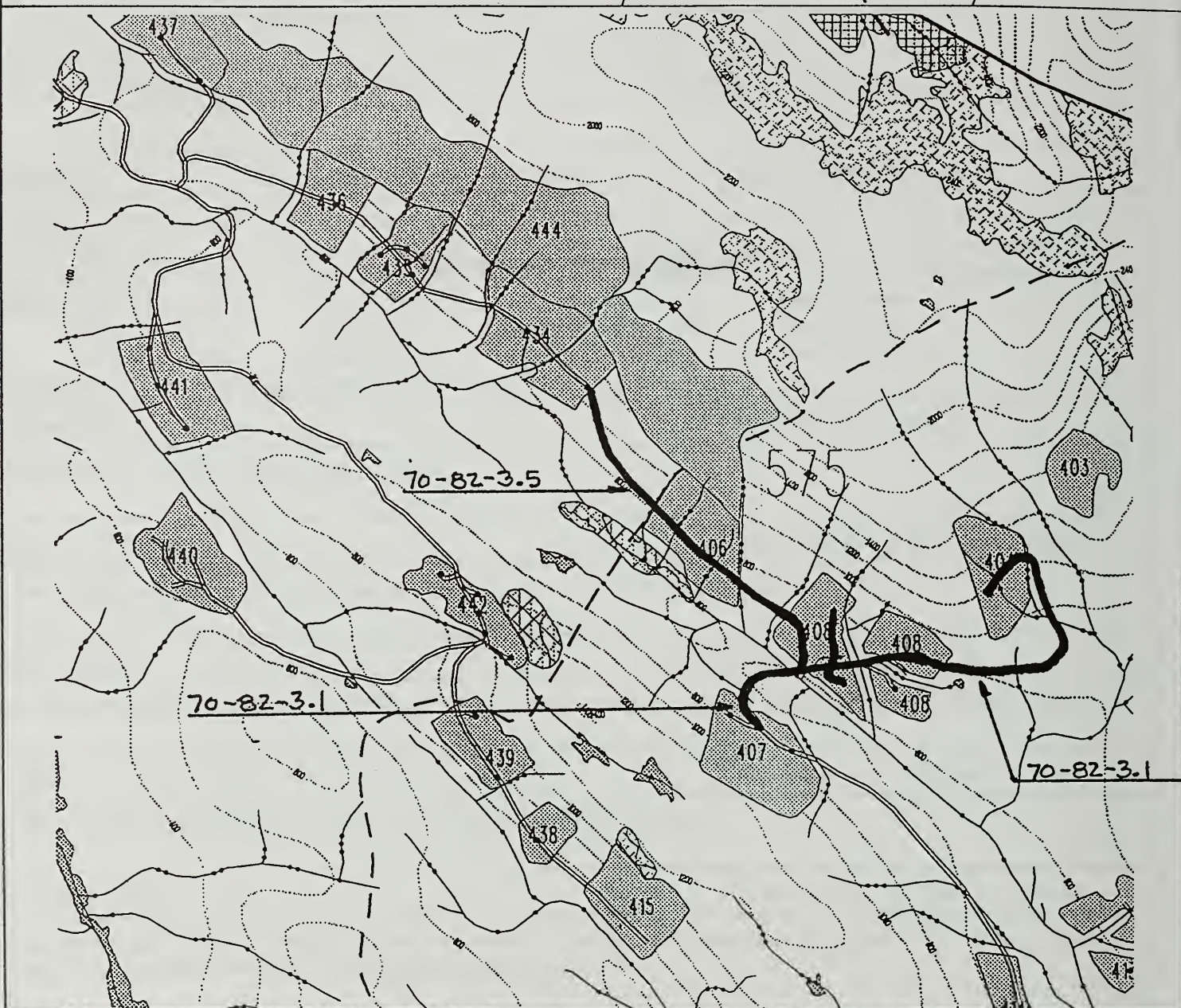
CONTROL LAKE PROJECT ROAD DESIGN CARD

"f"

ROAD : 70-82

VCU : 574/575

QUAD : D3SE/SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "f"

MAIN ROAD #: 70-82-3.1		VCU: 574 & 575	TOTAL LENGTH: 13300 FEET
ROAD CLASS: collector, local		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 7 </u> - CLASS II: <u> 1 </u>			
Engineering	Field Review: J. Doyal, J. Graves		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 8437'; Construction: 97% Easy, 3% Medium, 0% Difficult; # of >48" Culverts: 2; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 355'; # of "V" Notches: 0; Units Accessed: 4 units; # of Quarry Sites: 1; # of Switchbacks: 1; Ft. of Critical Grades: 516'. <u>Spurs:</u> Road #: 70-82-3.2, Length: 418', Construction type: easy (unit 575-408) Road #: 70-82-3.3, Length: 639', Construction type: easy (unit 575-408) Road #: 70-82-3.4, Length: 316', Construction type: easy (unit 575-408) Road #: 70-82-3.5, Length: 3490', Construction type: easy to medium Comments: The main road requires two 60" culverts, but otherwise it is easy construction. Spur 70-82-3.5 requires two 48" culverts. The first two spurs are associated with unit 575-408. A road to unit 574-403 was attempted but deemed impractical due to rock bluffs. The engineers noted a possible recreation area northeast of unit 575-403. The spur 70-82-3.5 was extended to connect between units 575-406 and 574-434. That 1/2 mile of unverified road will be used to complete a road loop that will be analyzed for the final haul route. The field engineers say that a road in that area can likely be built.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
<p>Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). Note, other road segments that provide access to this area require fish timing construction windows.</p>			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review:		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

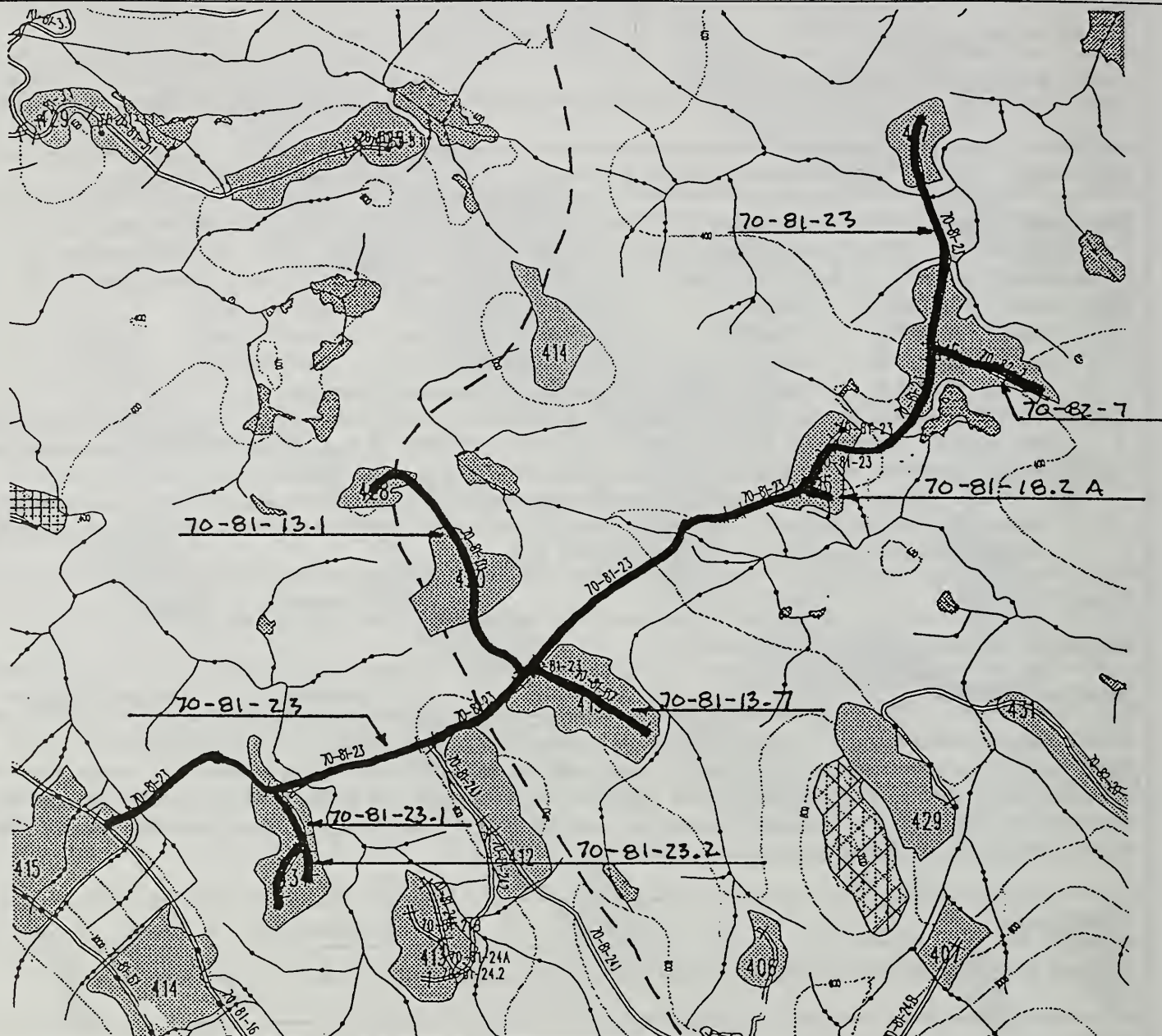
CONTROL LAKE PROJECT ROAD DESIGN CARD

"9"

ROAD : 70-81

VCU : 574/577

QUAD : D3SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

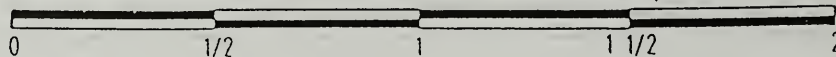
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1934

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "g"

MAIN ROAD #: 70-81-13.1		VCU: 574 & 577	TOTAL LENGTH: 4700 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY:	
TOTAL # STREAM CROSSINGS - CLASS I: _____ - CLASS II: _____			
Engineering	Field Review: T. Wetzel, G. Slawson		Office Review: K. Martin
<p><u>Main Road:</u> Length: 4700'; Construction: 79% Easy, 21% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 990'; # of "V" Notches: 0; Units Accessed: 574-420,577-428 # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 550'. <u>Spurs:</u> None Comments: This road has an average grade of 5-10% and average cross slopes of 10-20%. The road can be used to access lakes in the area.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "g"

MAIN ROAD #: 70-81-23		VCU: 574 & 577	TOTAL LENGTH: 32557 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>7</u> - CLASS II: <u>0</u>			
Engineering	Field Review: several crews		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 22420'; Construction: 78% Easy, 15% Medium, 7% Difficult; # of >48" Culverts: 2; # of Bridges: 2; Ft. of Cross Slopes >55%: 330'; Ft. of Muskeg Crossing: 1750'; # of "V" Notches: 1; Units Accessed: several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 4705'.</p> <p><u>Spurs:</u> Road #: 70-81-23.1, Length: 1909', Construction type: easy to medium (unit 577-434) Road #: 70-71-23.2, Length: 1473', Construction type: easy (unit 577-434) Road #: 70-81-13.7, Length: 1885', Construction type: easy (unit 574-413) Road #: 70-81-18.2A, Length: 900', Construction type: easy (unit 574-416) Road #: 70-82-7, Length: 1970', Construction type: easy (unit 574-416)</p> <p>Comments: This road will serve to access several units. The one large (60' span) bridge is at the beginning of the road. The two >48" culverts and "V" notch are at the very end of the road (near 577-417). Most of the critical grades are at 12% and are located in the middle section of the road. The road provides access to various nearby lakes.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Segment 70-81-23 between units 577-434 and 577-412 crosses a stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: C. Confer
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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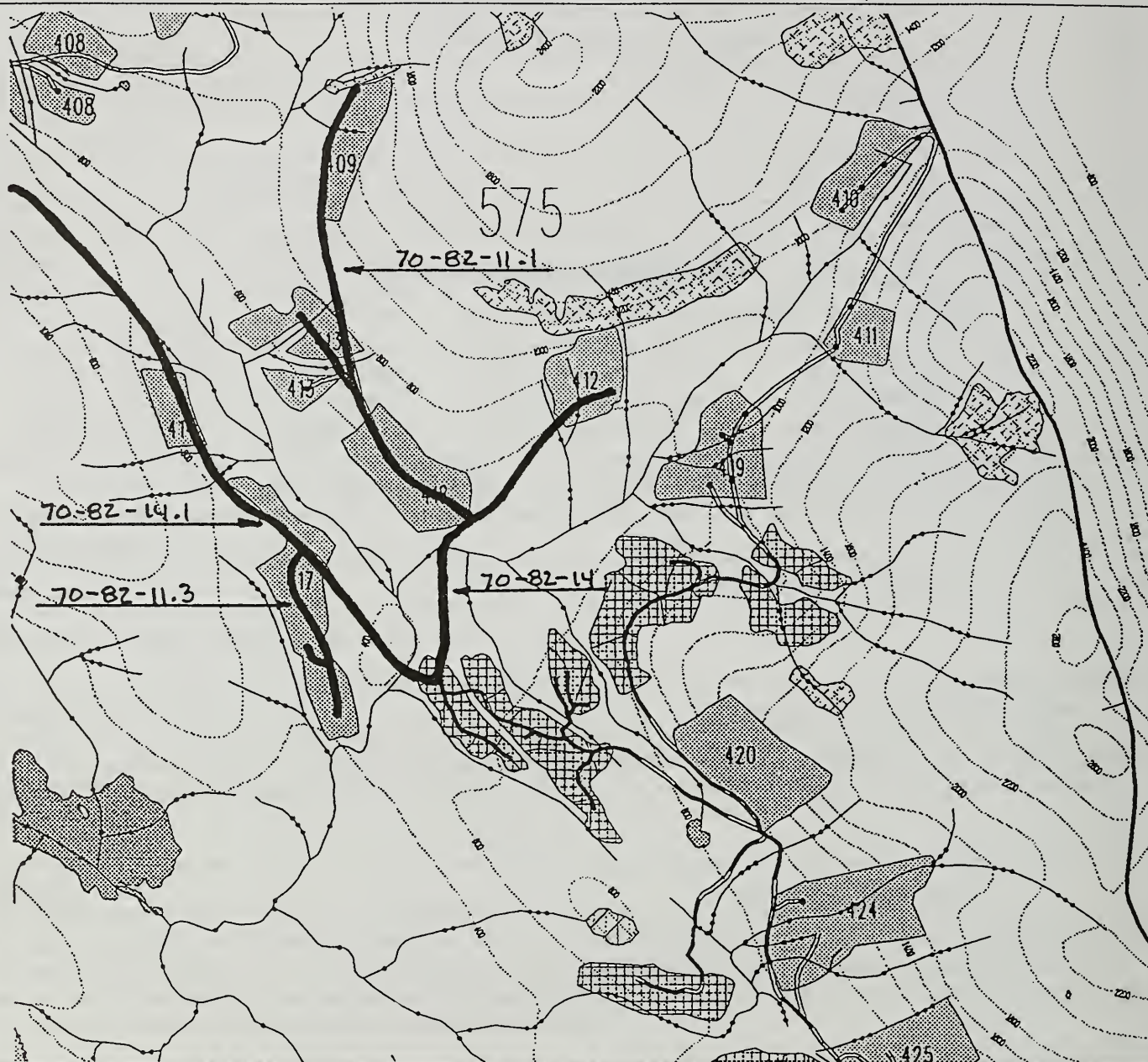
CONTROL LAKE PROJECT ROAD DESIGN CARD

"h"

ROAD : 70-82

VCU : 575

QUAD : D3SE



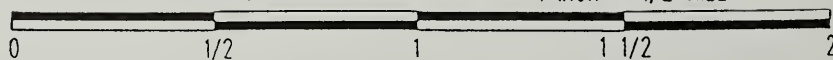
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

Revised

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "h"

MAIN ROAD #: 70-82-11.1		VCU: 575	TOTAL LENGTH: 8152 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>2</u>			
Engineering	Field Review: S Field, B. Wilkinson		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 5862'; Construction: 3% Easy, 97% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 359'; # of "V" Notches: 0; Units Accessed: 3 units; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 0. <u>Spurs:</u> Road #: 70-82-11.2; Length: 1790'; Construction type: easy (unit 575-413) Road #: 70-82-11.3; Length: 500'; Construction type: easy (unit 575-413) Comments: Note that in unit 575-409, the IDT decided to place the road lower down in the unit than flagged in the field. This change was recommended by the field engineer. This will reduce soil disturbance (by increasing deflection), reduce road construction costs and earthwork. The second noted spur in 575-413 is not field verified.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Note, other road segments that provide access to this area require fish timing construction windows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig:
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "h"

MAIN ROAD #: 70-82-14		VCU: 574 & 575	TOTAL LENGTH: 6288 FEET
ROAD CLASS: collector, local		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ - CLASS II: _____			
Engineering	Field Review: S. Field, B. Wilkinson		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 6288'; Construction: 98% Easy, 2% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 0; Ft. of Muskeg Crossing: 341'; # of "V" Notches: 0; Units Accessed: 575-412,418; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 355'. Comments: The main road takes off USFS road 3016, which will need a few culverts replaced. The bridge is a 50' span. Cross slopes are all < 30%, and road grades are gentle. Road 70-82-14 was mistakenly marked as 82-70-14 in the field.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "h"

MAIN ROAD #: 70-82-14.1		VCU: 575	TOTAL LENGTH: 20180 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>4</u> - CLASS II: <u>4</u>			
Engineering	Field Review: J. Doyal, Josh. Graves		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 15001'; Construction: 94% Easy, 6% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 1; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 735'; # of "V" Notches: 0; Units Accessed: SEVERAL; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 70-82-11.3, Length: 4183', Construction type: EASY (575-417) Road #: 70-82-11.3A, Length: 395', Construction type: EASY (575-417) Road #: 70-82-11.3B, Length: 208', Construction type: EASY (575-417) Road #: 70-82-11.3C, Length: 393', Construction type: EASY (575-417) Comments: The main road is part of a road loop that is to be analyzed for the final haul route. The four spurs are all associated with unit 575-417. There is a considerable amount of road to be built for unit 575-417.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows. Note, other road segments that provide access to this area require fish timing construction windows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

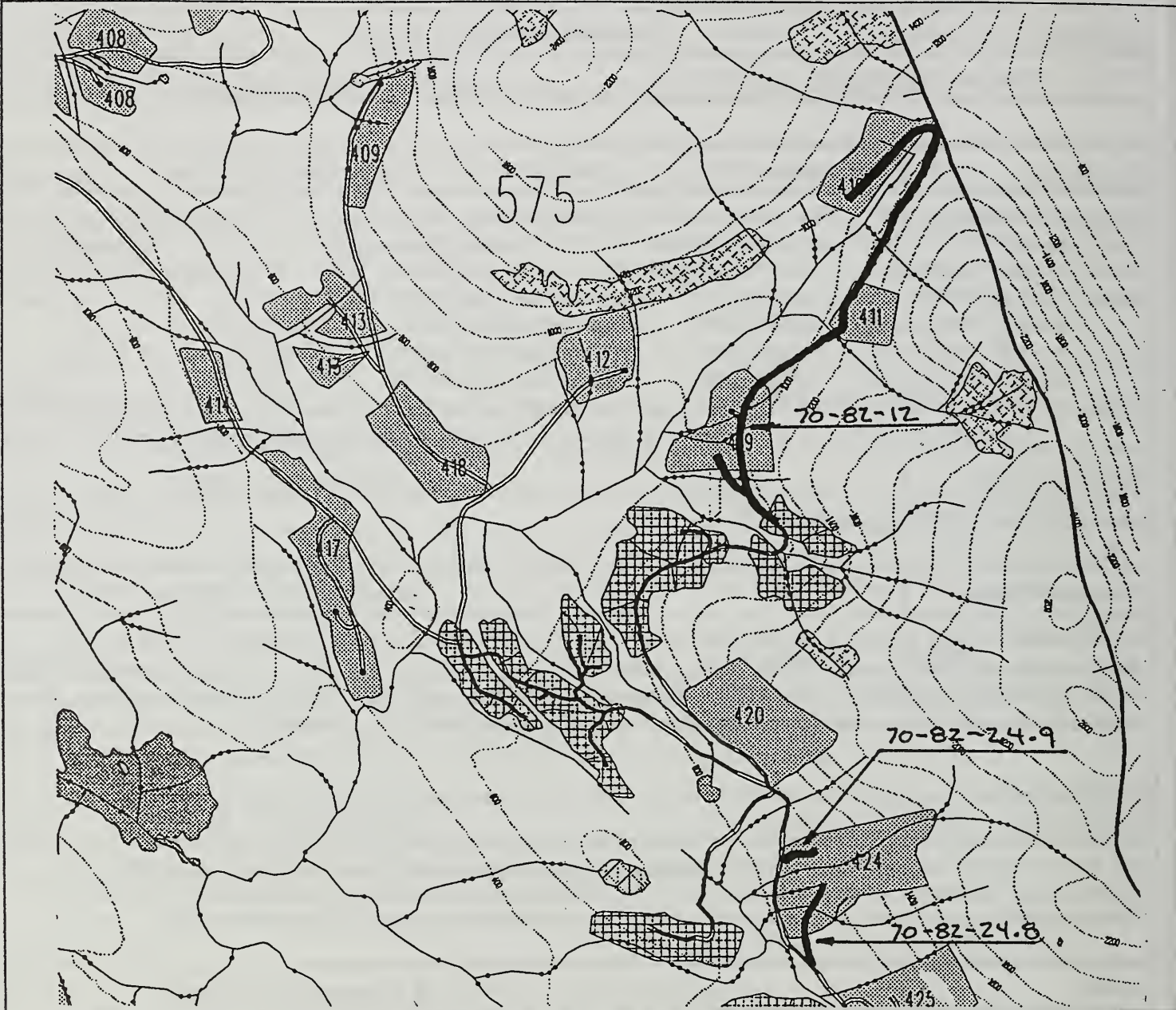
CONTROL LAKE PROJECT ROAD DESIGN CARD

"h"

ROAD : 70-82

VCU : 575

QUAD : D3SE



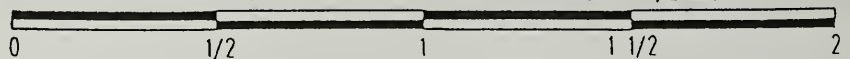
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "h"

MAIN ROAD #: 70-82-12		VCU: 575	TOTAL LENGTH: 7118 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>2</u>			
Engineering	Field Review: S. Field, B. Flatz		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 6618'; Construction: 90% Easy, 10% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 140'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 3 units; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 1000'.</p> <p><u>Spurs:</u> The two spurs in unit 575-419 combine to make 500' of easy to medium construction. The spurs are not flagged in or numbered. Unit 575-424 was altered by the IDT and the resulting two spurs are not field verified.</p> <p><u>Comments:</u> Several alternate routes were attempted in the field. The final location shown avoids a large stream crossing, "V" notches, and steep grades while better accessing future units. Note that the road is tagged in the field as 82-70-12.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

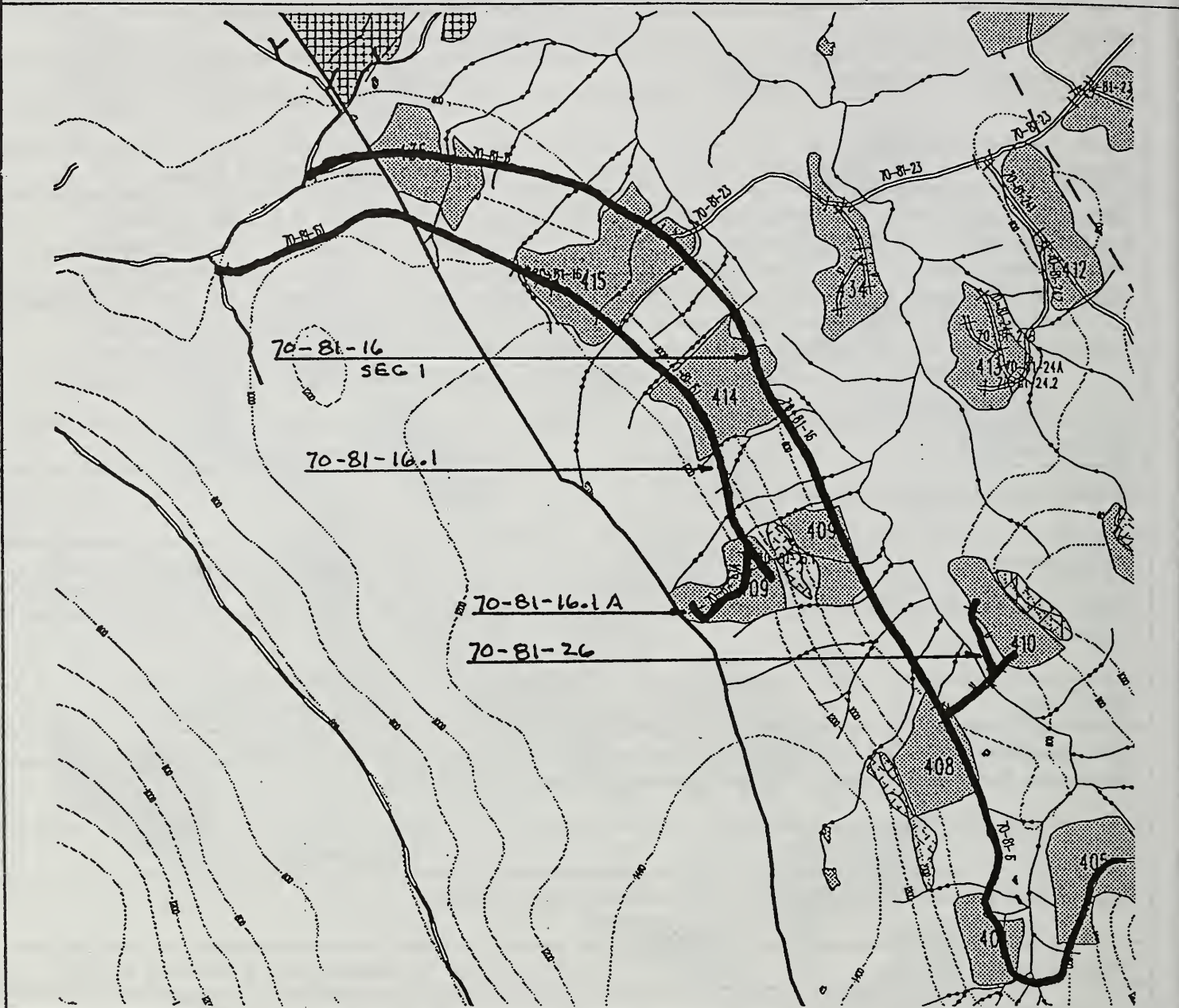
CONTROL LAKE PROJECT ROAD DESIGN CARD

" i "

ROAD : 70-81

VCU : 577

QUAD : D3SW&SE



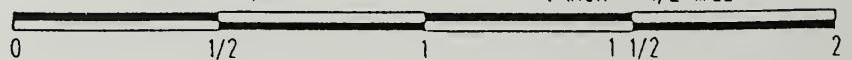
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "i"

MAIN ROAD #: 70-81-16.1		VCU: 577	TOTAL LENGTH: 17020 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>1</u>			
Engineering	Field Review: M. Hoshal, T. Wetzel		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 15050'; Construction: 19% Easy, 67% Medium, 14% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 1595'; Ft. of Muskeg Crossing: 1180'; # of "V" Notches: 9; Units Accessed: 3-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1565'. <u>Spurs:</u> Road #: 70-81-16.A, Length: 280', Construction type: easy (unit 577-415) Road #: 70-81-16.B, Length: 150', Construction type: easy (unit 577-415) Road #: 70-81-16.1A, Length: 1540', Construction type: easy to medium (unit 577-409) Comments: The main road follows the northeast side of a major ridge and accesses some of the best timber in the area. Note that the road location in 577-415 had minor changes. (See 577-415). The main road originally continued out to the top of unit 577-408. This last stretch of road will not likely be built because of the soils concerns in the top of 577-408. One of the noted "V" notches is in this end portion.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "i"

MAIN ROAD #: 70-81-16 Seg. 1		VCU: 577	TOTAL LENGTH: 23980 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____ 1 ____ - CLASS II: ____ 8 ____			
Engineering	Field Review: M. Hoshal, B. Wilkinson		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 23980'; Construction: 83% Easy, 3% Medium, 14% Difficult; # of >48" Culverts: 3; # of Bridges: 1; Ft. of Cross Slopes >55%: 2280'; Ft. of Muskeg Crossing: 630'; # of "V" Notches: 6; Units Accessed: several; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 1920'.</p> <p><u>Spurs:</u> Road #: 70-81-26 Length: 3400' Construction: easy (unit 577-410)</p> <p>Comments: This road is located at the base of a major ridge which has some of the best timber on the project. The bridge is a 90' span. The "V" notches are all small (less than 12' deep). This road will prove very economical to build. Note that only one of the units accessed by this road has spurs to the landings. The roads are not field verified. The field engineers could not find a good road location. Check this during final layout.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary. Segment between units 577-404 and 577-405 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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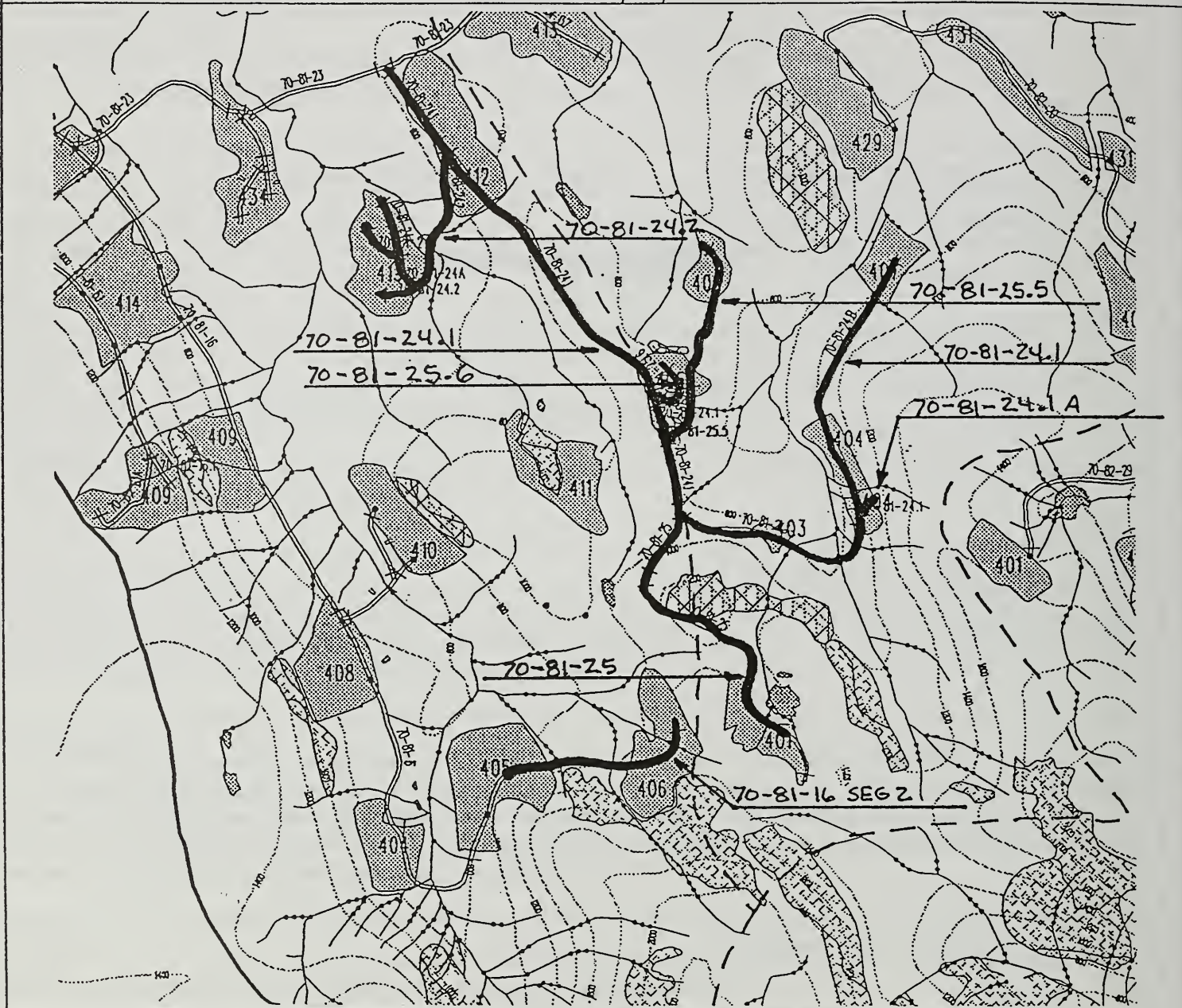
CONTROL LAKE PROJECT ROAD DESIGN CARD

"j"

ROAD : 70-81

VCU : 574/576/577

QUAD : D3SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

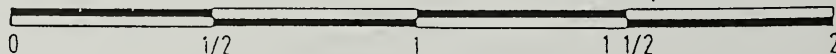
- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "j"

MAIN ROAD #: 70-81-24.1	VCU: 577 & 574	TOTAL LENGTH: 20226 FEET
ROAD CLASS: local, collector	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>2</u>		
Engineering	Field Review: M. Hoshal, B. Wilkinson	Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 18780'; Construction: 68% Easy, 26% Medium, 6% Difficult; # of >48" Culverts: 0; # of Bridges: 2; Ft. of Cross Slopes >55%: 550'; Ft. of Muskeg Crossing: 180'; # of "V" Notches: 0; Units Accessed: several; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 70-81-25.6, Length: 1200', Construction type: medium (unit 574-405) Road #: 70-81-24.1A, Length: 246', Construction type: easy (unit 574-404) Comments: This road has average construction except for the two bridges. Blowdown was noted at near 574-407.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.		
Soils/Geology		Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: spurs-7

square: "j"

MAIN ROAD #: 70-81-24.1 spurs		VCU: 574	TOTAL LENGTH: 19182 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____1____ - CLASS II: ____1____			
Engineering	Field Review: several crews		Office Review: several
<p><u>Main Road:</u> No main road. This is the larger spurs that connect to 70-81-24.1.</p> <p><u>Spurs:</u> Road #: 70-81-25, Length: 8697', Construction type: easy to medium (unit 574-401)</p> <p>Road #: 70-81-25.5, Length: 3920', Construction type: easy to medium (unit 574-406)</p> <p>Road #: 70-81-24.2, Length: 3375', Construction type: easy (unit 577-413)</p> <p>Road #: 70-81-24.A Length: 2200', Construction type: easy (unit 577-413)</p> <p>Road #: 70-81-24.B Length: 990', Construction type: easy (unit 577-413)</p> <p>Comments: This is an area of medium to poor quality timber. The patches of timber are sparse. Because of these reasons the spurs are very long roads and access only one unit; check economics. 70-81-25 was flagged into 576-406 which was dropped. As a result, the last 2700' of 70-81-25 will not be built.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "j"

MAIN ROAD #: 70-81-16 Seg. 2		VCU: 577	TOTAL LENGTH: 2650 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>0</u>			
Engineering	Field Review: J. Doyal, D. Kiester		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 2605'; Construction: 90% Easy, 0% Medium, 10% Difficult; # of >48" Culverts: 2; # of Bridges: 0; Ft. of Cross Slopes >55%: 257'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 577-406; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> none Comments: The difficult road construction and the >55% slopes are an area of drill & shoot construction.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

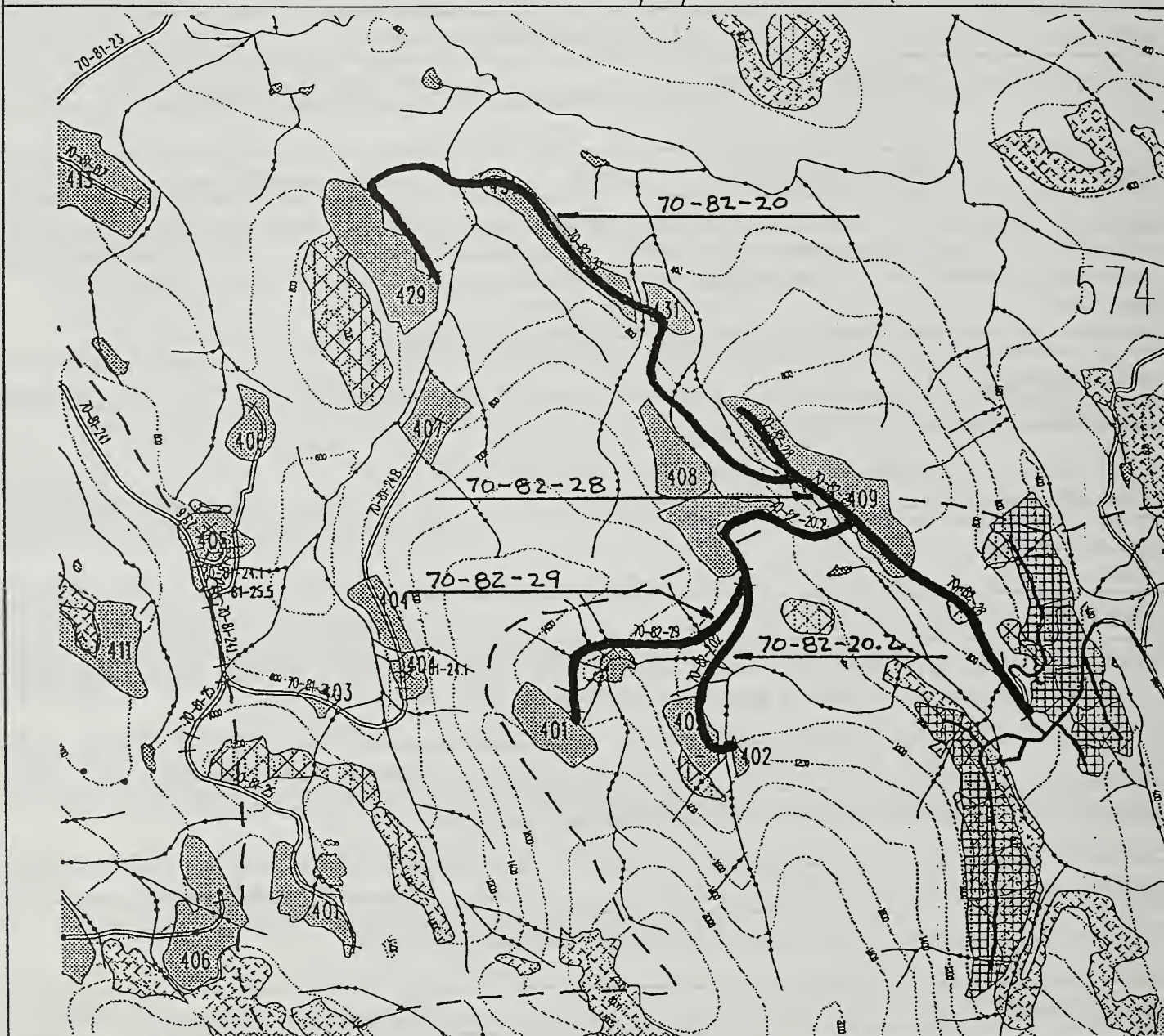
CONTROL LAKE PROJECT ROAD DESIGN CARD

"k"

ROAD : 70-82

VCU : 574/575/576

QUAD : D3SW



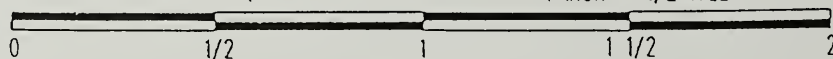
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "k"

MAIN ROAD #: 70-82-20		VCU: 574	TOTAL LENGTH: 11670 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____1____ - CLASS II: ____1____			
Engineering			
Field Review: B. Webster, T. Wetzel		Office Review: E. Urstadt	
<p><u>Main Road:</u> Length: 11670'; Construction: 64% Easy, 28% Medium, 8% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1790'; # of "V" Notches: 0; Units Accessed: 574-429,431; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 615'. <u>Spurs:</u> none Comments: The road originally was planned to continue north and access four more units. That road location was not used because three of the four units were dropped due to lack of merchantable timber. The critical grades are 15% adverse.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). Segment between units 574-429 and 574-431 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "k"

MAIN ROAD #: 70-82-20.2		VCU: 574 & 576	TOTAL LENGTH: 8875 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 1 </u>			
<div>Engineering</div> <div>Field Review: B. Webster, K. Martin</div> <div>Office Review: K. Jehnke</div>			
<p><u>Main Road:</u> Length: 4550'; Construction: 68% Easy, 22% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 645'; # of "V" Notches: 0; Units Accessed: 3-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1306'. <u>Spurs:</u> Road #: 70-82-29, Length: 4325', Construction type: easy to medium (unit 576-401) Comments: The main road has pitches of steep critical grade which may be eliminated if a full paper design of the road was done. The large culvert crosses a stream with an alluvial fan with several small channels. This crossing is close to the end of the road (in 576-402) and a temporary crossing should be considered. The 70-82-29 road 2000' of 15% favorable grade. An alternate road for 70-82-29 was considered on the east side of the lake construction costs are much less in the present location. 70-82-29 also accesses a possible recreation site (lake trails, views).</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "k"

MAIN ROAD #: 70-82-28		VCU: 576 & 574	TOTAL LENGTH: 6140 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: C. Barnhart, B. Webster		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 6140'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 527'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 574-409; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 300'. <u>Spurs:</u> none Comments: An alternate road was attempted to the top of 574-409 but it was not used due to high construction costs. This road will also serve to access roads to 6 other units.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns. \			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

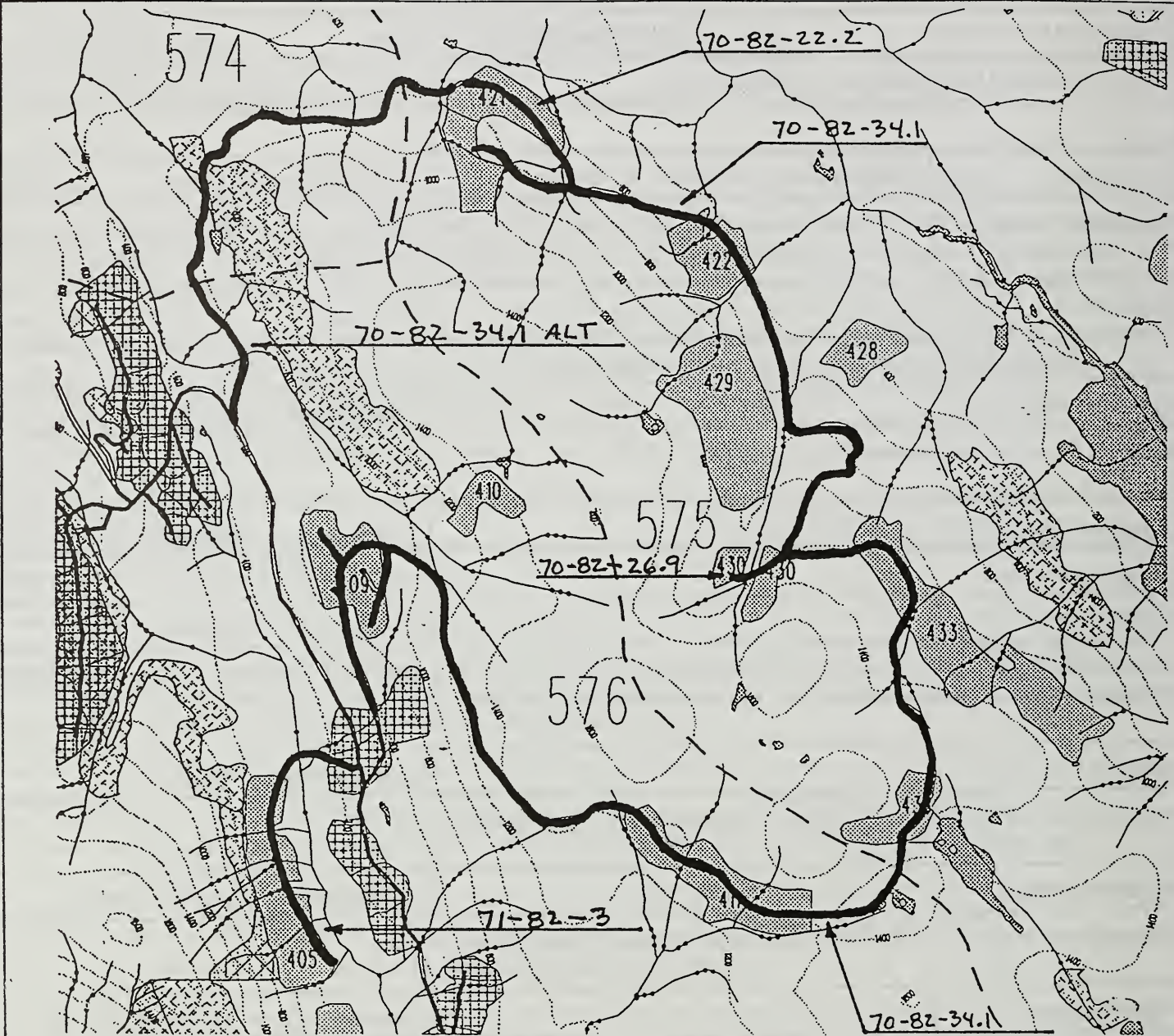
CONTROL LAKE PROJECT ROAD DESIGN CARD

"l"

ROAD : 70-82

VCU : 575/576

QUAD : C3NE/NW-D3SE/SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "1"

MAIN ROAD #: 70-82-34.1		VCU: 574 & 575 & 576	TOTAL LENGTH: 44567 FEET
ROAD CLASS: collector,local		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: Several crews		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 37784'; Construction: 75% Easy, 20% Medium, 5% Difficult; # of >48" Culverts: 3; # of Bridges: 1; Ft. of Cross Slopes >55%: 3710'; Ft. of Muskeg Crossing: 4960'; # of "V" Notches: 2; Units Accessed: Several; # of Quarry Sites: 3; # of Switchbacks: 2; Ft. of Critical Grades: 5745'. <u>Spurs:</u> Road #: 70-82-22.2, Length: 2222', Construction type: medium Road #: 70-82-22.3, Length: 651', Construction type: easy (an extension of 70-82-34.1) Road #: 70-82-26.9, Length: 1273', Construction type: easy (unit 575-430) Road #: 70-82-27.1, Length: 1210', Construction type: medium (unit 576-409) Road #: 70-82-26.2, Length: 640', Construction type: easy (unit 576-409) Road #: 70-82-27.3, Length: 680', Construction type: easy (unit 576-409) Road #: 70-82-26.4, Length: 107', Construction type: easy (unit 576-409) Comments: This road forms a loop that is to be analyzed for final haul route. The worst portion of critical grades, muskegs and switchbacks is between units 575-436 and 430. Partly because of this, the IDT decided to <u>helicopter log 575-433. That is also why an alternate road was continued west from unit 575-421.</u> (See 70-82-34.1 alt.) The road as shown in unit 575-422 was lowered by the IDT for visual reasons. This change was suggested by the field engineers.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). This restriction applies to the segment between units 575-422 and 575-430.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, <u>erodible material will not be deposited in live streams and sediment laden water pumped away</u> from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "1"

MAIN ROAD #: 70-82-34.1 (alt.)		VCU: 574 & 575	TOTAL LENGTH: 10678 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 2,3		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>2</u>			
Engineering			
Field Review: E. Dewilde, J. Herzberg		Office Review: E. Urstadt	
<p><u>Main Road:</u> Length: 10678'; Construction: 70% Easy, 11% Medium, 19% Difficult; # of >48" Culverts: 2; # of Bridges: 0; Ft. of Cross Slopes >55%: 904'; Ft. of Muskeg Crossing: 1159'; # of "V" Notches: 1; Units Accessed: Several; # of Quarry Sites: 4; # of Switchbacks: 0; Ft. of Critical Grades: 1435'.</p> <p><u>Spurs:</u> No spurs or units exist on this portion of road.</p> <p>Comments: This alternate route was selected to avoid visual areas, muskegs, switchbacks, and steep adverse grades that are located on 70-82-34.1. This road started from the end of spur 70-82-22.2. This road is part of a loop that is to be analyzed for haul direction. (See 70-82-34.1)</p>			
Timber/Silviculture		Comments by: J. Boyce -	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology		Comments by: T. Stewart	
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "1"

MAIN ROAD #: 71-82-3		VCU: 576	TOTAL LENGTH: 7928 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 2 </u>			
Engineering			
Field Review: J. Doyal, J. Graves		Office Review: K. Jehnke	
<p><u>Main Road:</u> Length: 7928'; Construction: 76% Easy, 17% Medium, 7% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 1; Units Accessed: 576-405; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 839'. <u>Spurs:</u> none Comments: This road needs a 40' span bridge and accesses only one unit. A temporary bridge is recommended. The 15% critical grades are favorable. The "V" notch is only 6' deep by 14' wide and will not be difficult to cross. The last part of this road which went to unit 576-431 will not be used because of an IDT decision to helicopter log that unit.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

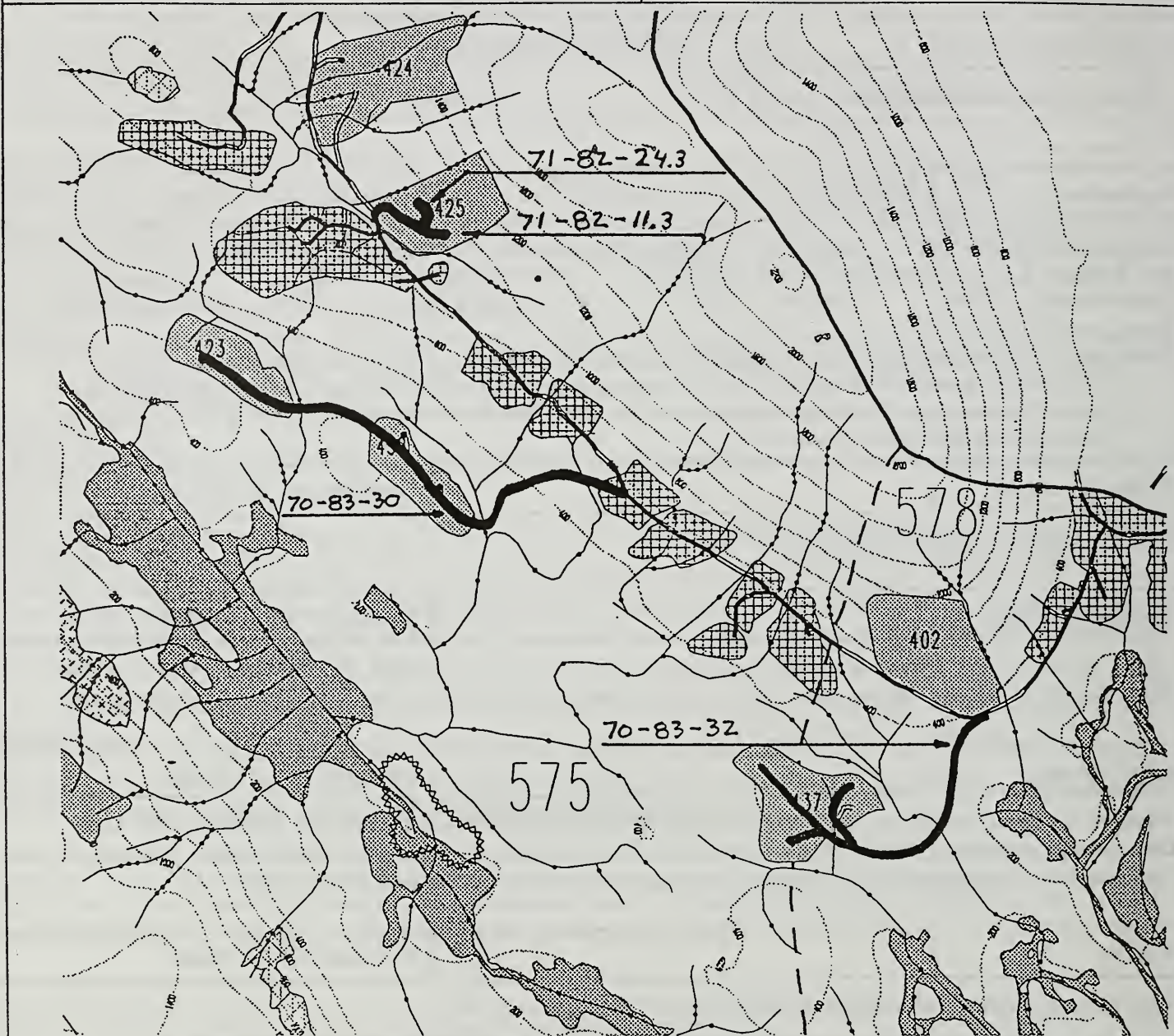
CONTROL LAKE PROJECT ROAD DESIGN CARD

" m "

ROAD : 70-83

VCU : 575/578

QUAD : D3SE



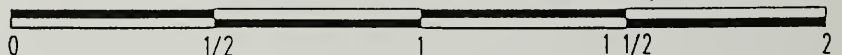
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "m"

MAIN ROAD #: 70-83-32		VCU: 575 & 578	TOTAL LENGTH: 7223 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: S. Field, J. Grave		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 5362'; Construction: 60% Easy, 27% Medium, 13% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 575-437; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 463'. <u>Spurs:</u> Road #: 70-83-32.1 Length: 642', Construction type: easy (unit 575-437) Road #: 70-83-32.2 Length: 1030', Construction type: easy (unit 575-437) Road #: 70-83-32.2A Length: 189', Construction type: easy (unit 575-437) Road #: 71-82-11.3 Length: 600', Construction type: easy (unit 575-425) Road #: 71-82-24.3 Length: 800', Construction type: easy (unit 575-425) Road #: 71-82-24.1 Length: 1700', Construction type: easy (unit 575-425) Comments: The IDT changed unit 575-425 due to visual constraints; and the spurs into that unit are not field verified. The main road accesses one unit. The engineers tried to keep the road out of the Scenic River LUD (East of 575-437), but decided that that was not practical due to the steep slopes and wet soils found on the alternate route.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "m"

MAIN ROAD #: 70-83-30		VCU: 575	TOTAL LENGTH: 8270 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>3</u> - CLASS II: <u>0</u>			
Engineering	Field Review: T. Wetzel, D. Foster		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 8270'; Construction: 66% Easy, 22% Medium, 12% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 280'; # of "V" Notches: 0; Units Accessed: 575-423,432; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1640'. <u>Spurs:</u> A very short spur is in unit 575-432. Comments: This road can be used to access Thorne Lake.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Segment to unit 575-423 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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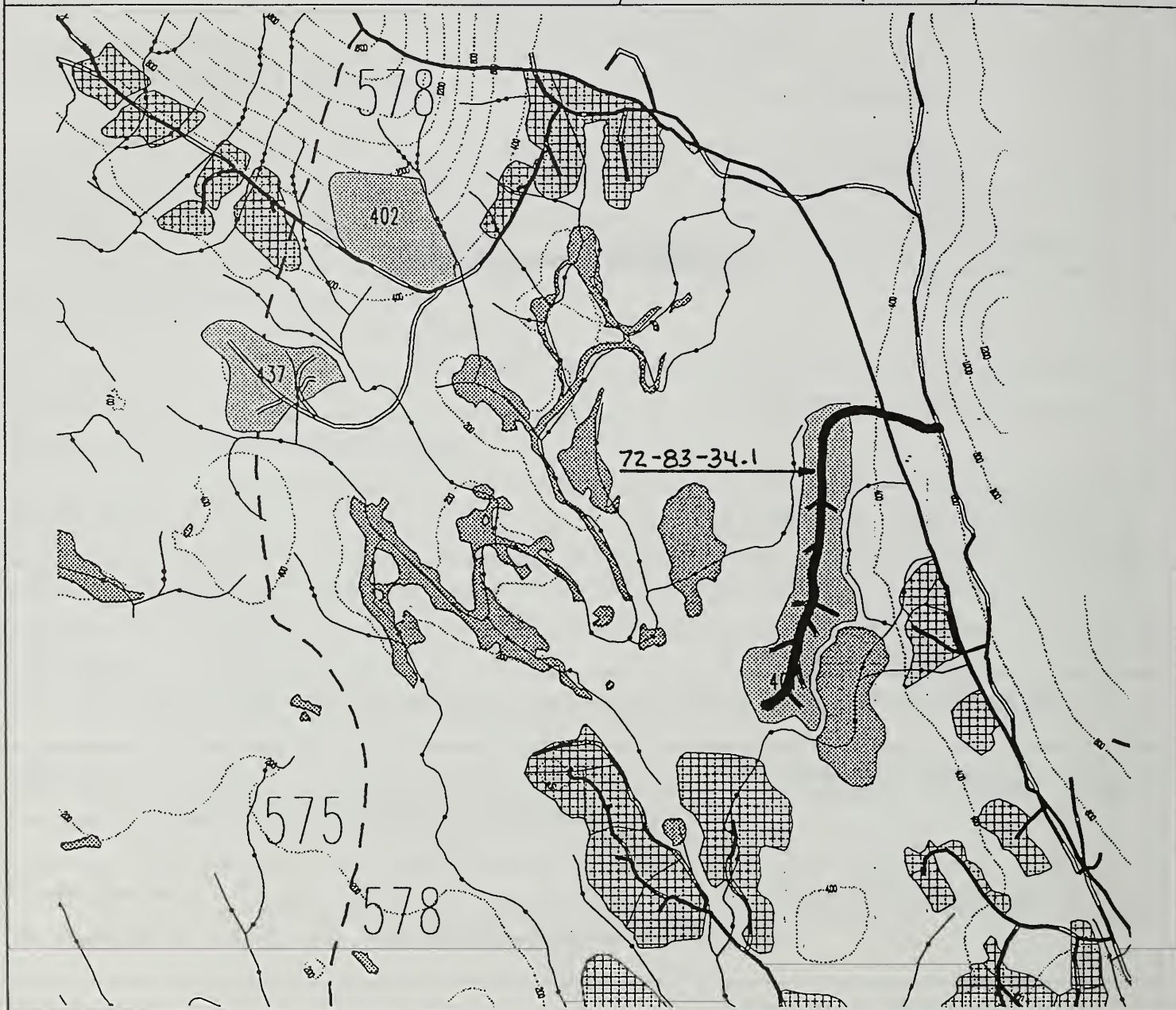
CONTROL LAKE PROJECT ROAD DESIGN CARD

"n"

ROAD : 71-82

VCU : 575/578

QUAD : C2NW/NE-D3SE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

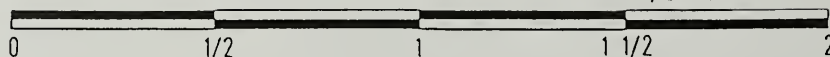
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

Page 1

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "n"

MAIN ROAD #: 72-83-34.1		VCU: 578	TOTAL LENGTH: 9811 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering			
Field Review: J. Doyal, J. Herzberg, J. Spolar		Office Review: K. Jehnke	
<p><u>Main Road:</u> Length: 7495'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 129'; # of "V" Notches: 0; Units Accessed: 578-401; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 72-83-34.1A Length: 291', Construction type: easy Road #: 72-83-34.1B Length: 531', Construction type: easy Road #: 72-83-34.1C Length: 284', Construction type: easy Road #: 72-83-34.1D Length: 132', Construction type: easy Road #: 72-83-34.1E Length: 327', Construction type: easy Road #: 72-83-34.1F Length: 144', Construction type: easy Road #: 72-83-34.1G Length: 215', Construction type: easy Road #: 72-83-34.1H Length: 165', Construction type: easy Road #: 72-83-34.1I Length: 227', Construction type: easy</p> <p>Comments: The set of short spurs all go to the only unit accessed by this road: 578-401. The road is very easy to build and will access fair timber. The road could also access a lake to the south east of 578-401.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
No special concerns.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

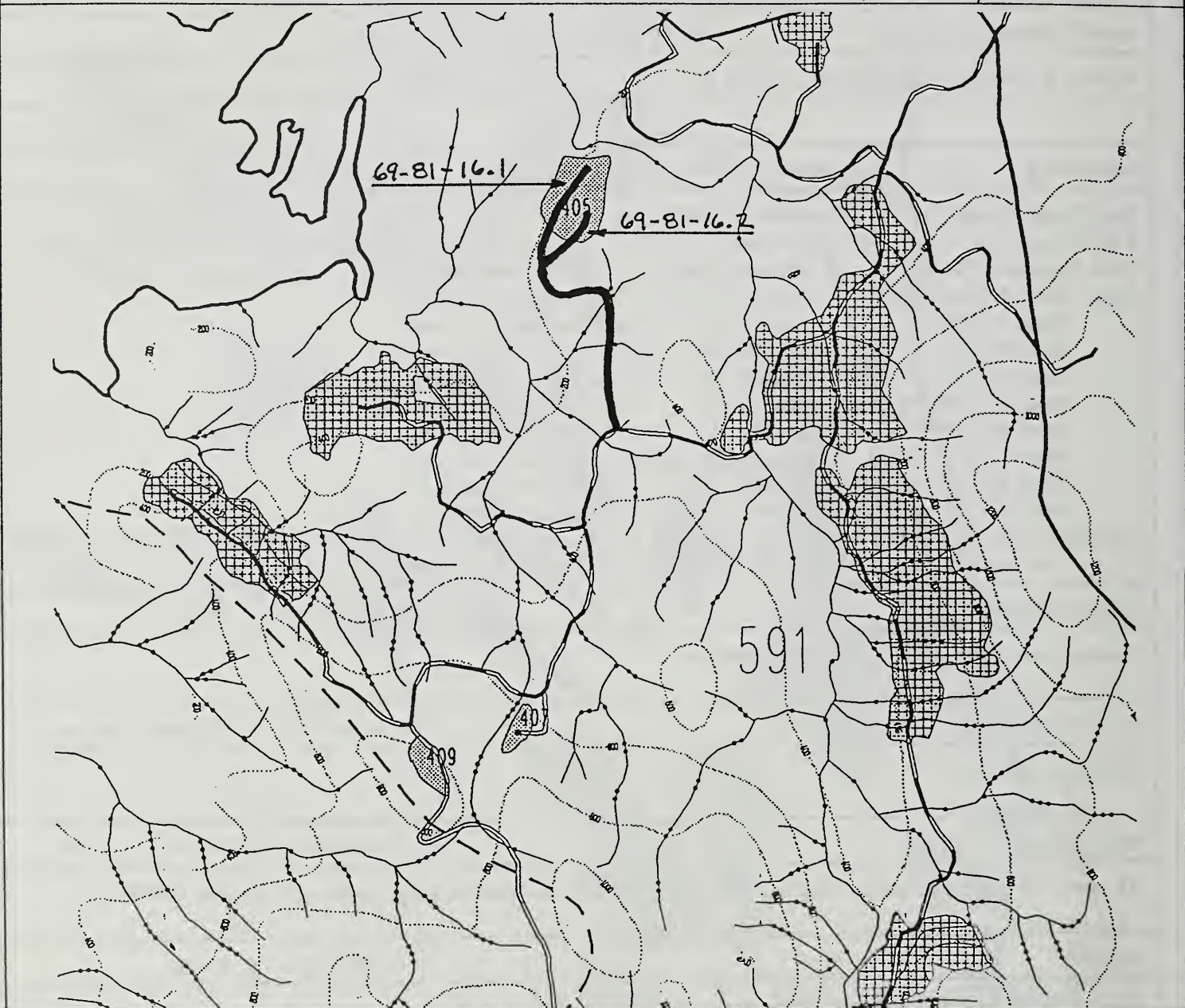
CONTROL LAKE PROJECT ROAD DESIGN CARD

"O"

ROAD : 71-79

VCU : 591

QUAD : C4NW/NE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

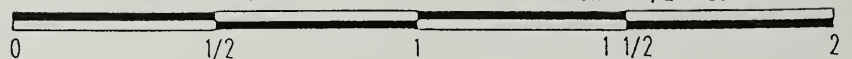
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 23, 1994

Plasma

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "o"

MAIN ROAD #: 69-81-16.1		VCU: 591	TOTAL LENGTH: 6807 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>			
Engineering	Field Review: E. Urstadt, J. Herzberg		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 5707'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 400'; # of "V" Notches: 0; Units Accessed: 591-405; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 69-81-16.2 Length: 1100' Construction: easy (unit 591-405) Comments: An alternate route was tried but was not used due to a large creek crossing. The spur was suggested and verified by the field engineers but was not flagged in the field.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

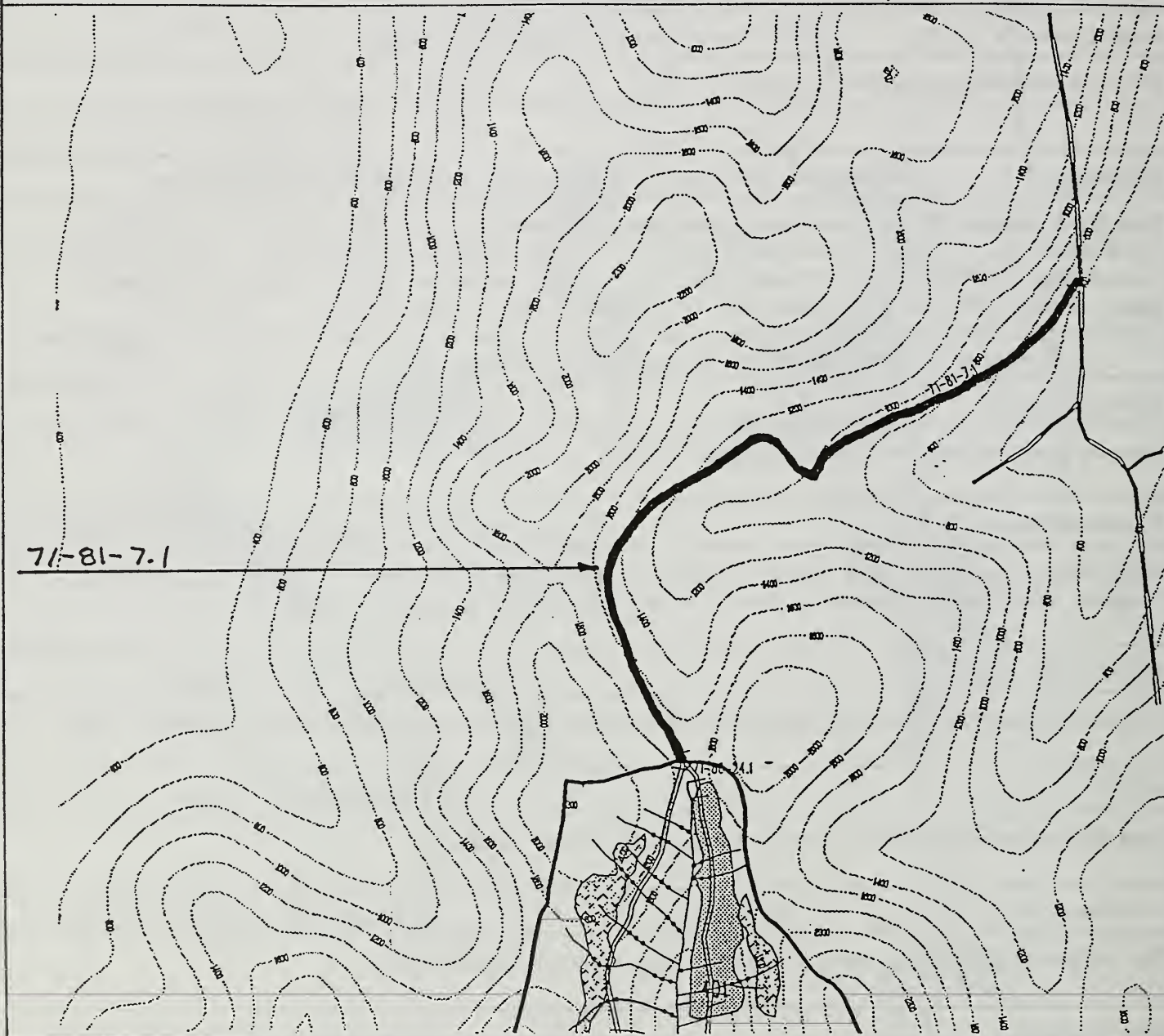
CONTROL LAKE PROJECT ROAD DESIGN CARD

"P"

ROAD : 71-81

VCU : 594

QUAD : C4NE



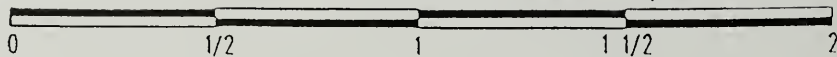
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- KMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "p"

MAIN ROAD #: 71-81-7.1		VCU: 594?	TOTAL LENGTH: 22012 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: S. Field, B. Flatz		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 22012'; Construction: 20% Easy, 70% Medium, 10% Difficult; # of >48" Culverts: 4; # of Bridges: 1; Ft. of Cross Slopes >55%: 5435'; Ft. of Muskeg Crossing: 239'; # of "V" Notches: 11; Units Accessed: 7-units; # of Quarry Sites: 4; # of Switchbacks: 0; Ft. of Critical Grades: 4445'. <u>Spurs:</u> none</p> <p>Comments: Much thought was put into the design and initial trial grade for this road. Although the data suggests that this is a difficult and expensive road, the shown location is the only feasible route to access the valley to the south of the road from USFS land. To use this road the existing USFS road will need bridges and culverts replaced. And even though the road is four miles long, it does not access much timber. A much better route is to haul the timber south out of the valley using Sealaska roads (See 71-81-7). That possibility forms a road loop that will be analyzed for the final haul route. This road segment is not part of any alternative in the EIS.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

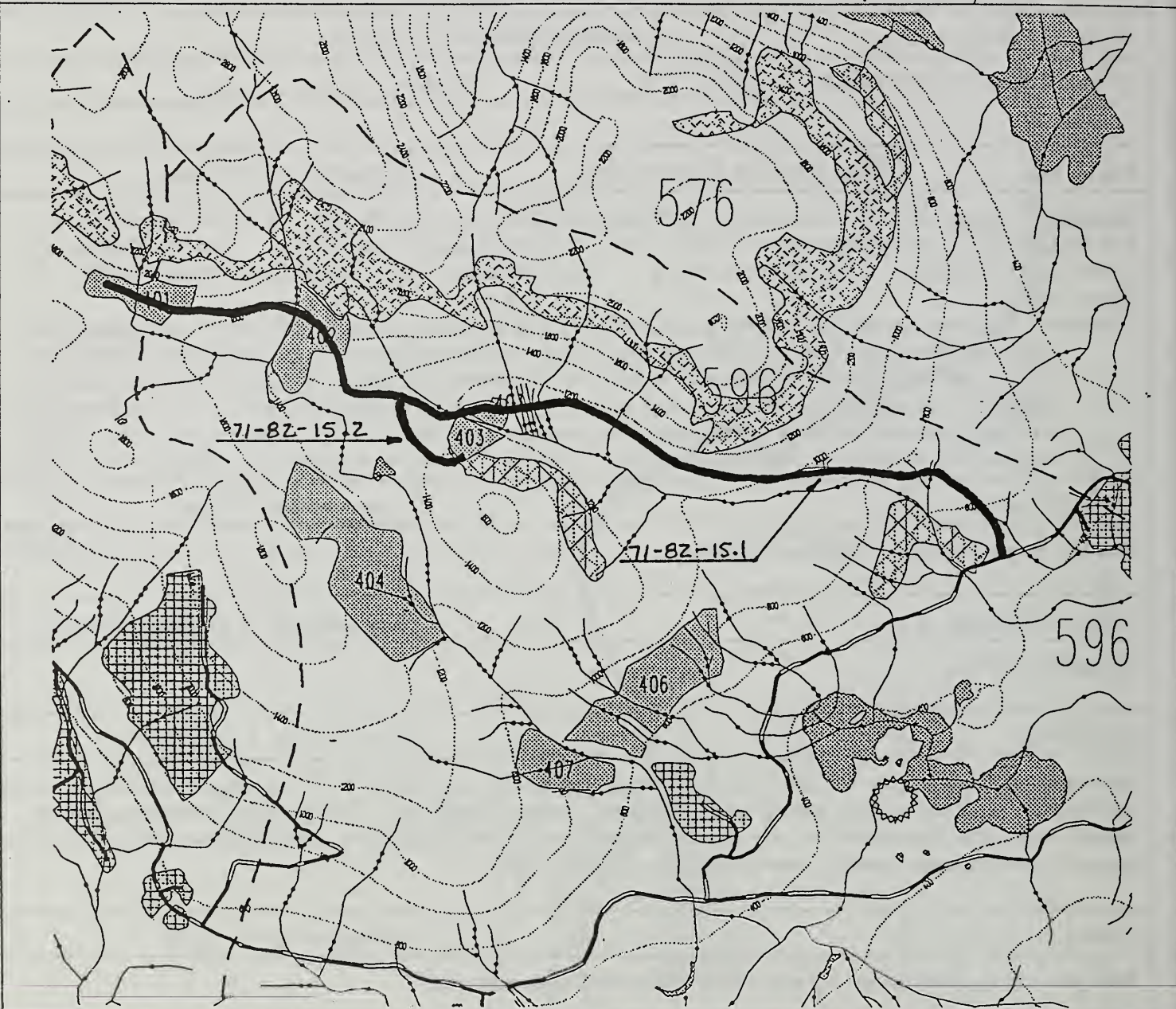
CONTROL LAKE PROJECT ROAD DESIGN CARD

"g"

ROAD : 71-82

VCU : 596

QUAD : C3NE/NW



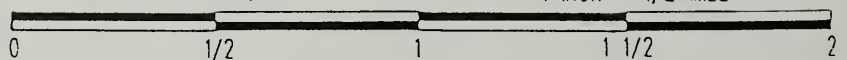
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

Allegany

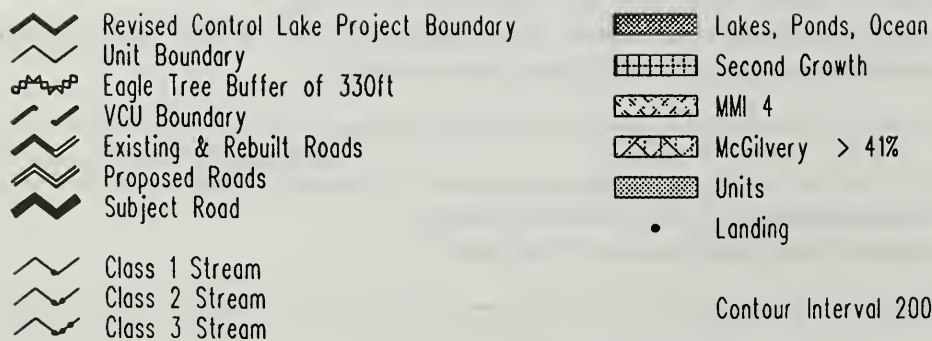
CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "q"

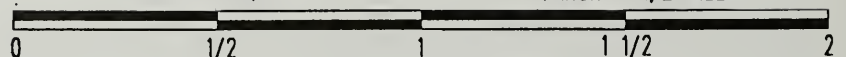
MAIN ROAD #: 71-82-15.1		VCU: 596	TOTAL LENGTH: 20560 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 9 </u>			
Engineering	Field Review: M. Hoshal, T. Wetzel		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 19160'; Construction: 14% Easy, 62% Medium, 24% Difficult; # of >48" Culverts: 2; # of Bridges: 1; Ft. of Cross Slopes >55%: 4300'; Ft. of Muskeg Crossing: 2330'; # of "V" Notches: 3; Units Accessed: 3 units; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 2500'.</p> <p><u>Spurs:</u> Road #: 71-82-15.2, Length: 1400', Construction type: easy</p> <p>Comments: The main road has two large stream crossings, and is a will be an expensive road to build when compared to the amount of timber accessed. The spur is for unit 596-403.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
<p>This segment of the road will not be visible from a Priority Travel Route/Use Area.</p> <p>Keep road to unit 596-403 open upon completion of harvest, close road beyond unit. Build a parking area for 3 to 4 vehicles near unit 596-403 for use in accessing potential Thorne Mountain trail.</p>			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

"r"

QUAD : C3



1 INCH = 1/2 MILE



Poliquara e

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "r"

MAIN ROAD #: 71-82-2	VCU: 576	TOTAL LENGTH: 10704 FEET
ROAD CLASS: local	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>		
Engineering	Field Review: B. Wilkinson, J. Graves	Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 10231'; Construction: 78% Easy, 19% Medium, 13% Difficult; # of >48" Culverts: 7; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 138'; # of "V" Notches: 4; Units Accessed: 3-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1021'.</p> <p><u>Spurs:</u> Road #: 71-82-2.1, Length: 150', Construction type: easy (576-432) Road #: 71-82-2.2, Length: 145', Construction type: easy (576-433) Road #: 71-82-2.3, Length: 178', Construction type: easy (576-433)</p> <p>Comments: The reasons for the difficult construction are that this road has 7 large creek crossings. Four of them are in "V" notches. One of the "V" notches has excessive bedload movement and will need large culverts or possibly a bridge. The critical grades are mostly a 12% grade.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
No special concerns.		
Soils/Geology		Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "r"

MAIN ROAD #: 71-82-11		VCU: 576	TOTAL LENGTH: 15970 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>4</u> - CLASS II: <u>0</u>			
Engineering	Field Review: several crews		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 12550'; Construction: 91% Easy, 9% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 318'; # of "V" Notches: 0; Units Accessed: 5-units; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-82-12.2, Length: 2650', Construction type: easy to medium (actually part of 71-82-11) Road #: 71-82-12.3, Length: 420', Construction type: easy (unit 576-414) Road #: 71-82-11.3 Length: 3500', Construction type: easy to medium (unit 576-417) Comments: Several routes were tried in this area. The final locations are deemed the best locations. See road file for 71-82-11 for more information. 71-82-12.2 is actually part of 71-82-11 due to this relocation of the roads. The data is shown separately to avoid future confusion.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Segment to units 576-417 and 576-413 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Segment to unit 576-417 is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction. Remainder of roads do not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Review: D. Putnam/S. Moorhead		Comments by: W. Greiser/M. Greenig
<p>Cultural - No cultural resources encountered along portions of road within units 756-415, 416, and 417. Remainder of road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "r"

MAIN ROAD #: 71-82-12		VCU: 576	TOTAL LENGTH: 9833 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: _____ - CLASS II: _____			
Engineering	Field Review: M. Whitty, J. Graves		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 5787'; Construction: 79% Easy, 21% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 650'; # of "V" Notches: 0; Units Accessed: 576-415,416; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 260'. <u>Spurs:</u> Road #: 71-81-11.4 Length: 330', Construction type: medium (unit 576-416) Road #: 71-82-12.1, Length: 3716', Construction type: medium (unit 476-415) Comments: Different routes for the main road were attempted. The final location was picked because it has the best creek crossings. This road can be used to access Cutthroat Creek. The medium construction is due to wet areas that will need considerable rock.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources	Field Observations: D. Putnam/S. Moorhead		Comments by: W. Greiser/M. Greenig
<p>Cultural - No cultural resources encountered along portions of road within units 576-415, 416, and 417. Remainder of road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "r"

MAIN ROAD #: 71-82-14.1		VCU: 576	TOTAL LENGTH: 12525 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>0</u>			
Engineering	Field Review: S. Field, M. Hoshal		Office Review: K. Martin
<p><u>Main Road:</u> Length: 6040'; Construction: 57% Easy, 43% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 960'; # of "V" Notches: 0; Units Accessed: 576-420,421; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 1300'. <u>Spurs:</u> Road #: 71-82-14.1A, Length: 410', Construction type: easy (unit 576-420) Road #: 71-82-14.2, Length: 3975', Construction type: easy (unit 576-422) Road #: 71-82-14.3, Length: 2100', Construction type: easy (unit 576-422) Comments: The critical grades do not exceed 12%. On the longest spur, 71-82-14.2, cross slopes did not exceed 35%.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "r"

MAIN ROAD #: 71-82-15.3		VCU: 576 & 596	TOTAL LENGTH: 7403 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 1 </u>			
<div>Engineering</div> <div>Field Review: J. Doyal, J. Estebrook, C Giles</div> <div>Office Review: K. Jehnke</div>			
<p><u>Main Road:</u> Length: 5250'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1500'; # of "V" Notches: 0; Units Accessed: 595-412, 596-418; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1037'. <u>Spurs:</u> Road #: 71-81-15.3A, Length: 750', Construction type: easy (unit 596-412) Road #: 71-82-153.B, Length: 150', Construction type: easy (unit 596-412) Road #: 71-82-15.9, Length: 1253', Construction type: easy (unit 576-419) Comments: The spur 71-82-15.9 has poor economics due to the poor timber in 576-419. Look at using a forwarder or a "cold deck" and swing operation to avoid road construction during final layout.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

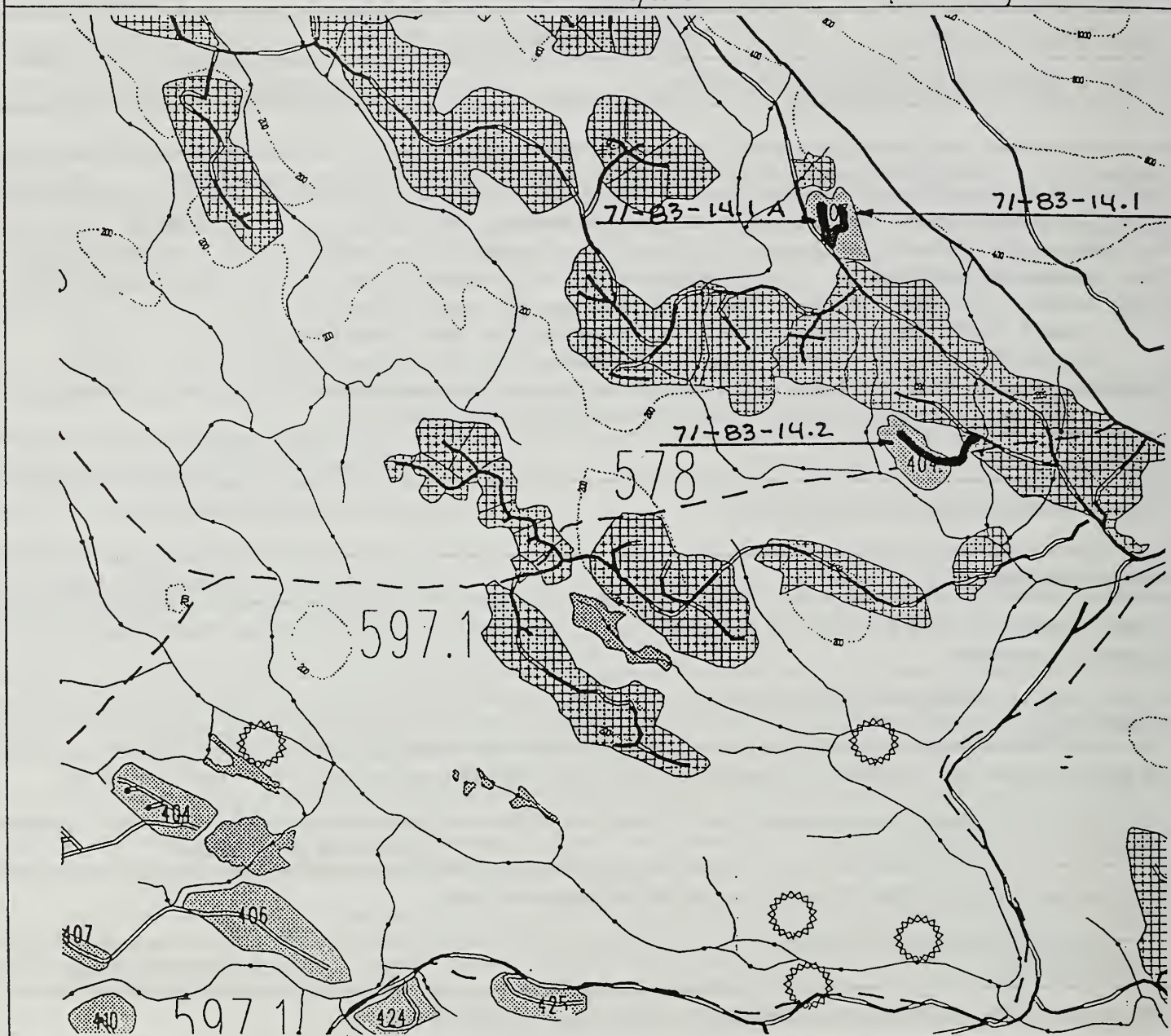
CONTROL LAKE PROJECT ROAD DESIGN CARD

"S"

ROAD : 71-83

VCU : 578/597.1

QUAD : C2NW/NE



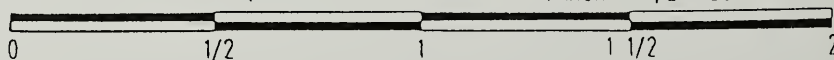
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

Page 1

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: USFS3015

square: "s"

MAIN ROAD #: USFS 3015		VCU: 578	TOTAL LENGTH: 2706 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: E. Urstadt, J. Spolar		Office Review: K. Jehnke
<u>Main Road:</u> The main road used is USFS 3015. <u>Spurs:</u> Road #: 71-83-14.1, Length: 1051', Construction type: easy (unit 578-403) Road #: 71-83-14.1A, Length: 205', Construction type: easy (unit 578-403) Road #: 71-83-14.2 Length: 1450', Construction type: easy (unit 578-404) Comments: These are short spurs which take off an existing USFS road.			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

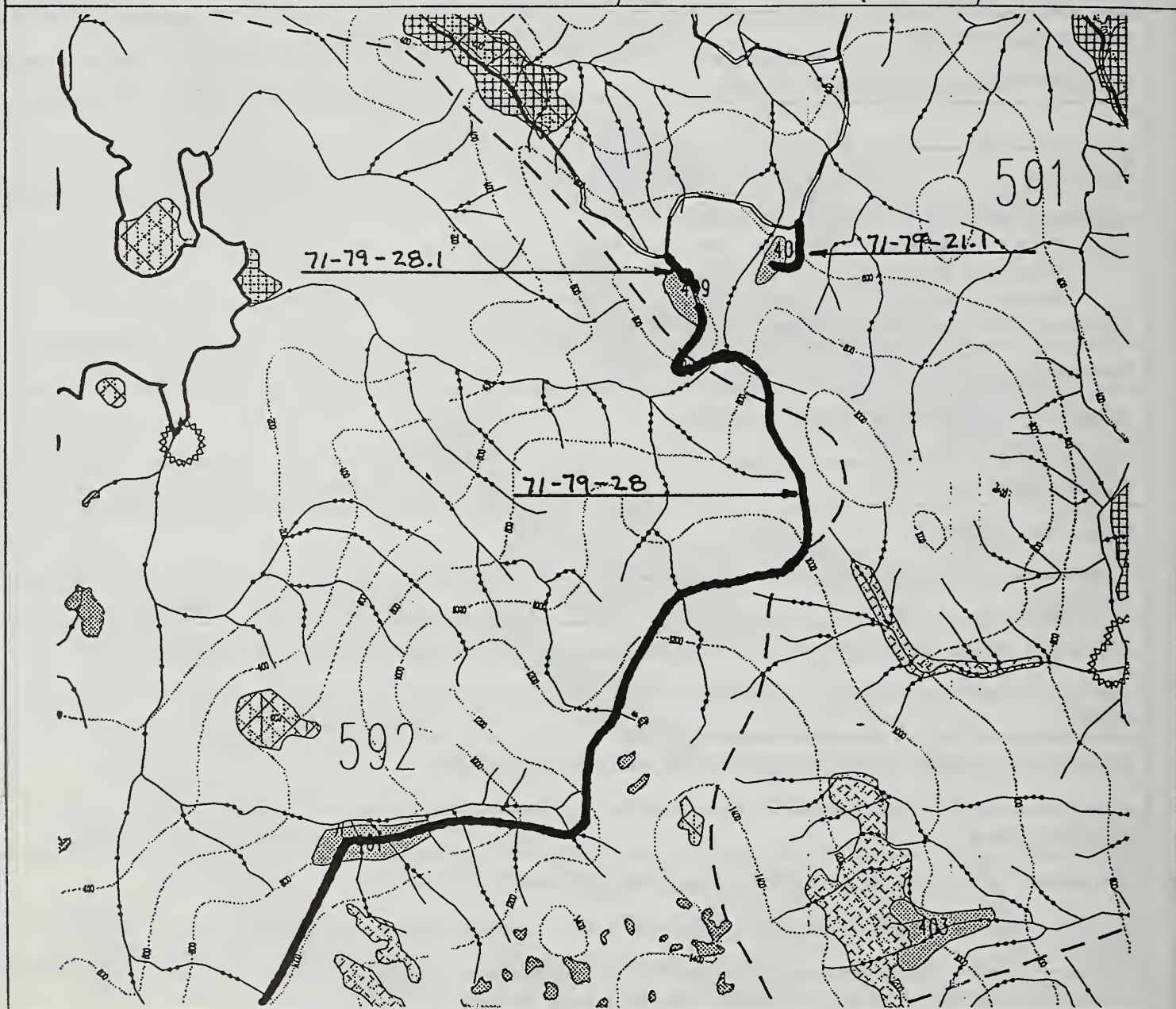
CONTROL LAKE PROJECT ROAD DESIGN CARD

"t"

ROAD : 71-79

VCU : 591/592

QUAD : C4NW/NE



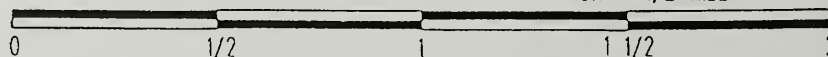
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

squares: "t"

MAIN ROAD #:71-79-28 Seg. A,B		VCU:591 & 592	TOTAL LENGTH: 41234 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____4____ - CLASS II: ____4____			
Engineering	Field Review:		Office Review: E. Urstadt, K. Jehnke
<p><u>Main Road:</u> Length: 38499'; Construction: 92% Easy, 4% Medium, 4% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 2278'; Ft. of Muskeg Crossing: 17510'; # of "V" Notches: 3; Units Accessed: Several; # of Quarry Sites: 3; # of Switchbacks: 1; Ft. of Critical Grades: 547'. <u>Spurs:</u> Road #: 71-79-28.5 Length: 267', Construction type: easy (unit 592-401) Road #: 71-79-21.1, Length: 1065', Construction type: easy (unit 591-407) Road #: 71-79-28.1', Length: 1403', Construction type: easy (unit 591-409) Comments: The very beginning of 71-79-28 is the spur 71-79-28.1. The main road is long and continues on to other road design maps; segments A & B are summarized on this page. The location of the main road was changed by the IDT between 592-401 and 592-402 in order to avoid the primitive recreation area. This section has not been field verified, and the field engineers think the new location will be difficult but possible. The roads in this area access small volumes of timber, and thus the economics of some of the worst on the project. Consider helicopter yarding to water or barge to avoid the high amount of road construction per unit of wood.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Road from unit 592-401 to 592-404 is within "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

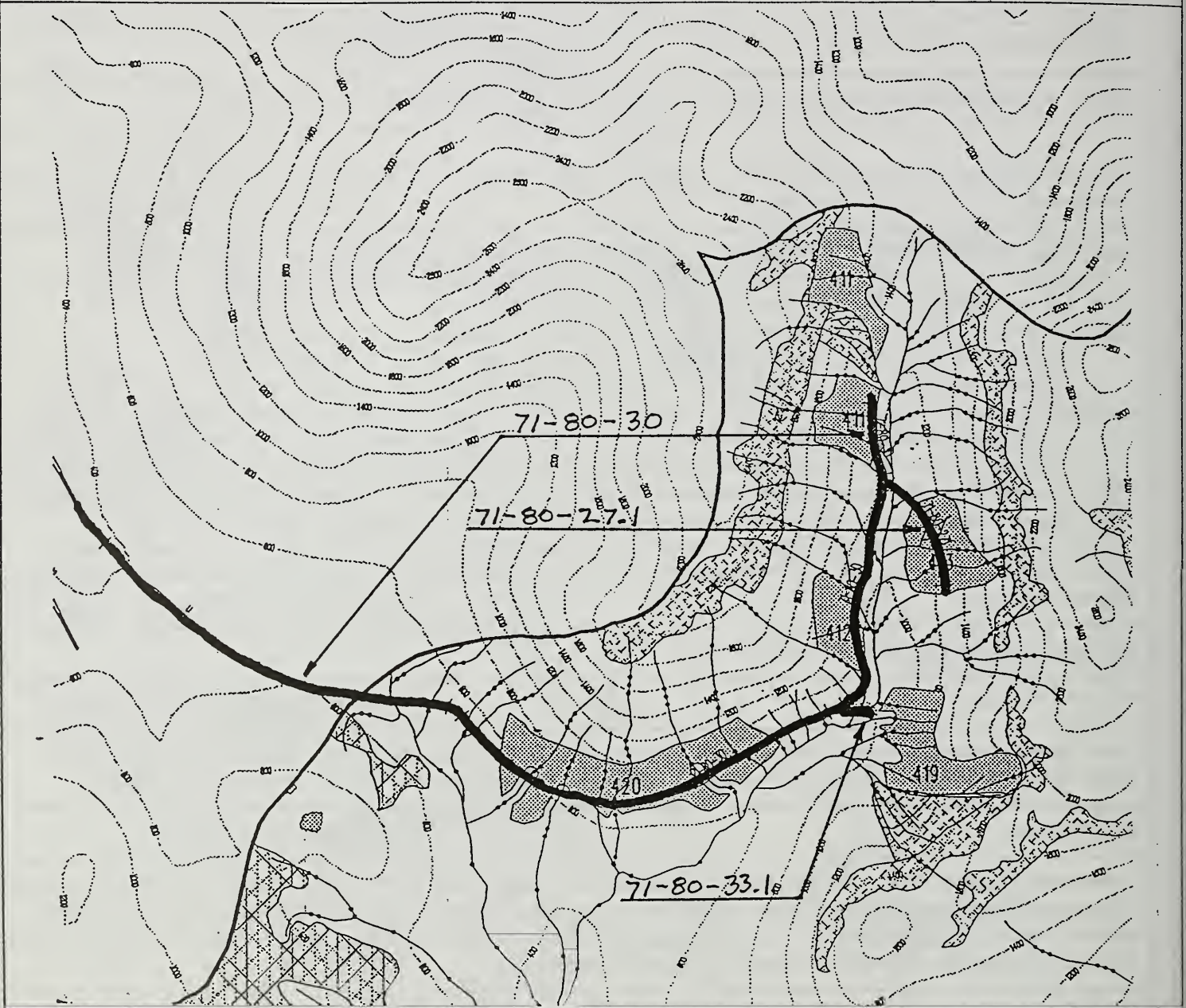
CONTROL LAKE PROJECT ROAD DESIGN CARD

"u"

ROAD : 71-80

VCU : 594

QUAD : C4NE&NW



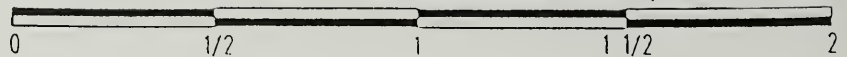
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



October 04, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "u"

MAIN ROAD #: 71-80-30		VCU: 594 & ?	TOTAL LENGTH: 26192 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 3 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: S. Field, B. Flatz		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 23125'; Construction: 98% Easy, 2% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 155'; Ft. of Muskeg Crossing: 351'; # of "V" Notches: 0; Units Accessed: 3-units; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-80-27.1, Length: 2447', Construction type: medium (unit 594-413) Road #: 71-80-33.1 Length: 620', Construction type: easy (unit 594-419) Comments: The main road opens up a large area of currently inaccessible land and timber. The bridge location is the important feature of this road. The field crew believes that the flagged location is the best location, but suggests to look at connecting the road up to the other spur off of USFS 2050. The other spur crosses the stream but has had its bridge removed, and replacing the bridge should be considered during final layout. The spur to 594-413 requires a 72" culvert. 71-80-33.1 accesses a large helicopter landing for 594-419.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

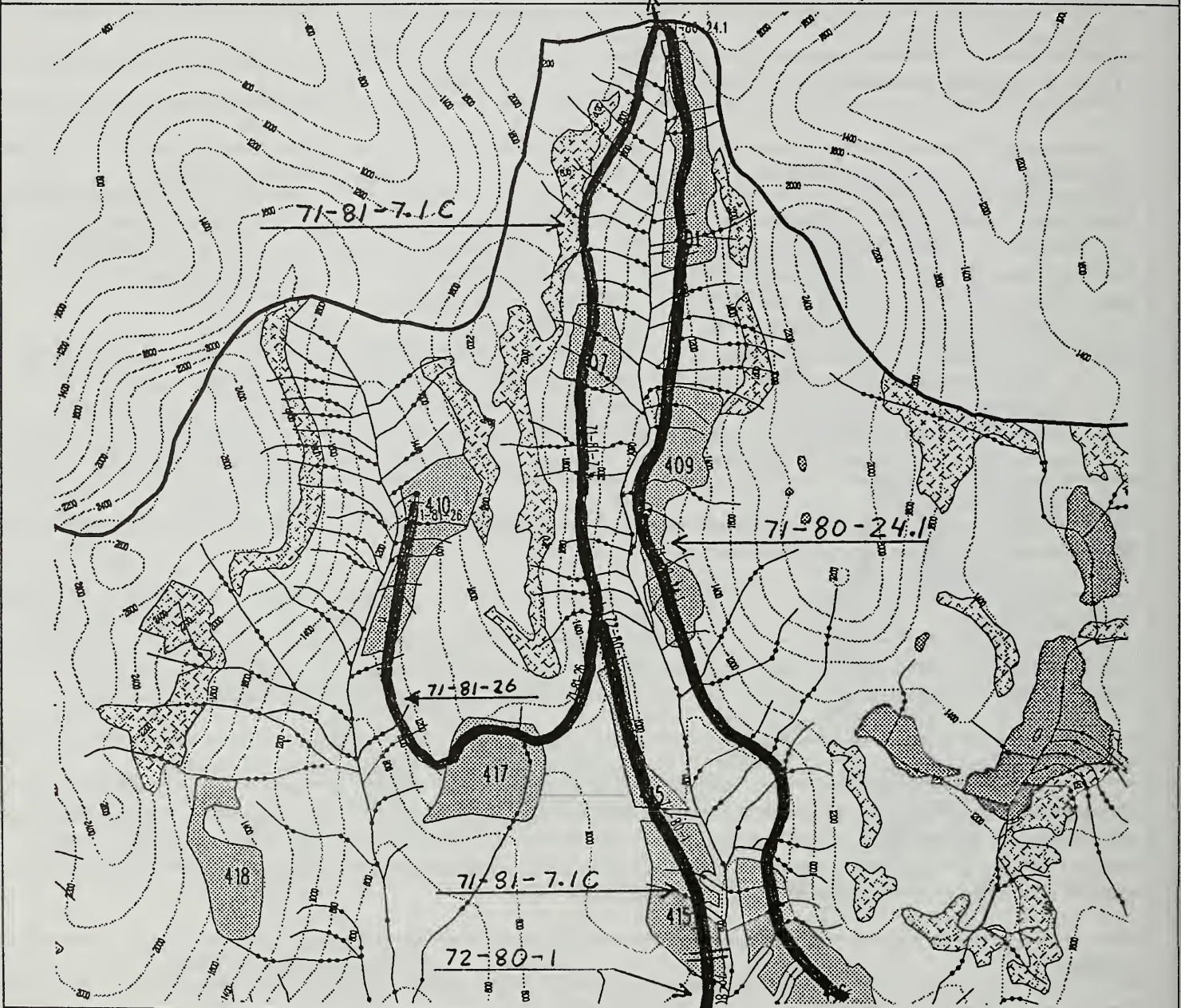
CONTROL LAKE PROJECT ROAD DESIGN CARD

"V"

ROAD : 71-81

VCU : 594

QUAD : C4NE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



December 06, 1994

Page 1

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "v"

MAIN ROAD #: 71-81-7.1C		VCU: 594	TOTAL LENGTH: 12561 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: J. Doyal, M. Hoashal		Office Review: E. Urstadt, J. Doyal
<p><u>Main Road:</u> Length: 8231'; Construction: 13% Easy, 38% Medium, 49% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 4057'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 3610'.</p> <p><u>Spurs:</u> Road #: 72-80-1, Length: 4330', Construction type: medium to difficult (tie to Sealaska)</p> <p>Comments: One half of the main road requires endhaul type construction. Be sure to look for a large endhaul disposal site before final layout. The main road also has 3610' of 15% grades. The spur is a connection between the roads in this valley and the existing Sealaska roads to the south. The main road combined with the spur form part of a road loop for which the final haul route will be determined during the network analysis (See 71-81-7.1).</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary. Road to unit 594-415 from south crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "v"

MAIN ROAD #: 71-81-26		VCU: 594	TOTAL LENGTH: 10227 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: J. Doyal, J. Graves		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 10227'; Construction: 34% Easy, 30% Medium, 36% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 3892'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 594-410,417; # of Quarry Sites: 1; # of Switchbacks: 1; Ft. of Critical Grades: 3926'. <u>Spurs:</u> none Comments: The critical grades on this road are 15%. 1243' are favorable and 2683' are adverse grades. This has a considerable amount of endhaul. Be sure to locate an endhaul disposal site before final layout (See 71-81-7.1C).</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Unit 594-417 and associated road is within "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "v"

MAIN ROAD #: 71-80-24.1		VCU: 594	TOTAL LENGTH: 17485 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>7</u> - CLASS II: <u>1</u>			
Engineering	Field Review: B. Webster, T. Wetzel		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 17485'; Construction: 77% Easy, 23% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 3209'; Ft. of Muskeg Crossing: 110'; # of "V" Notches: 1; Units Accessed: 3-units; # of Quarry Sites: several; # of Switchbacks: 0; Ft. of Critical Grades: 4315'. <u>Spurs:</u> none Comments: This road parallels a class I stream for several thousand feet. It also has a large amount of critical grades. Most of the critical grades are 15% adverse.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
<p>Unit 594-416 and associated road is within "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone. Build a parking area for 3 to 4 vehicles at unit 594-409 for access to Shinaku Lakes. Close road beyond parking area.</p>			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

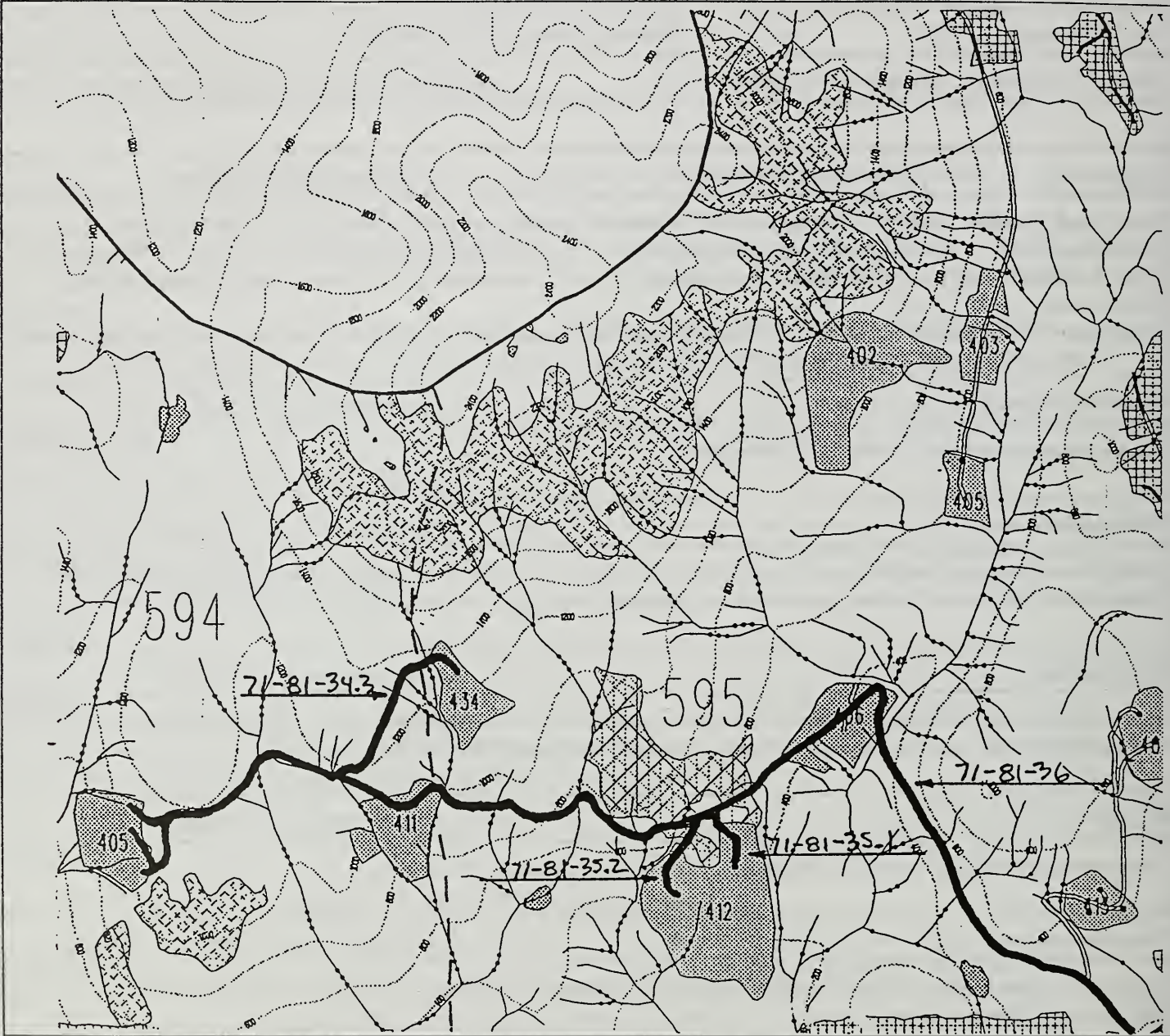
CONTROL LAKE PROJECT ROAD DESIGN CARD

"w"

ROAD : 71-81

VCU : 594/595

QUAD : C3NW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1934

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "w"

MAIN ROAD #: 71-81-36		VCU: 594 & 595	TOTAL LENGTH: 33531 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2,3		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 9 </u>			
Engineering	Field Review: E. Urstadt, C. Barnhart & crews		Office Review: C. Barnhart
<p><u>Main Road:</u> Length: 25035'; Construction: 45% Easy, 39% Medium, 16% Difficult; # of >48" Culverts: 5; # of Bridges: 1; Ft. of Cross Slopes >55%: 2130'; Ft. of Muskeg Crossing: 1484'; # of "V" Notches: 2; Units Accessed: several; # of Quarry Sites: 0; # of Switchbacks: 1; Ft. of Critical Grades: 1432'. <u>Spurs:</u> Road #: 71-81-36.E, Length: 1318', Construction type: easy (unit 594-405) Road #: 71-81-36.F, Length: 765', Construction type: easy (unit 594-405) Road #: 71-81-34.3, Length: 3939', Construction type: medium (unit 595-434) Road #: 71-81-35.1, Length: 894', Construction type: easy (unit 595-412) Road #: 71-81-35.2, Length: 1019', Construction type: medium (unit 595-412) Road #: 71-81-36A, Length: 247', Construction type: easy (unit 595-406) Road #: 71-81-36B, Length: 314', Construction type: medium (unit 595-406) Comments: The main road will be fairly expensive to build and will access several present and future units that have good quality timber. The bridge location east of 595-406 is the best stream crossing and serves to control the road location.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Segments to units 574-405 and 595-406 cross stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Units 595-405, -405, -406, -411, -412, and -434 are within "Waters Around Craig and Klawock" Viewshed. Maximum Modification VQO. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

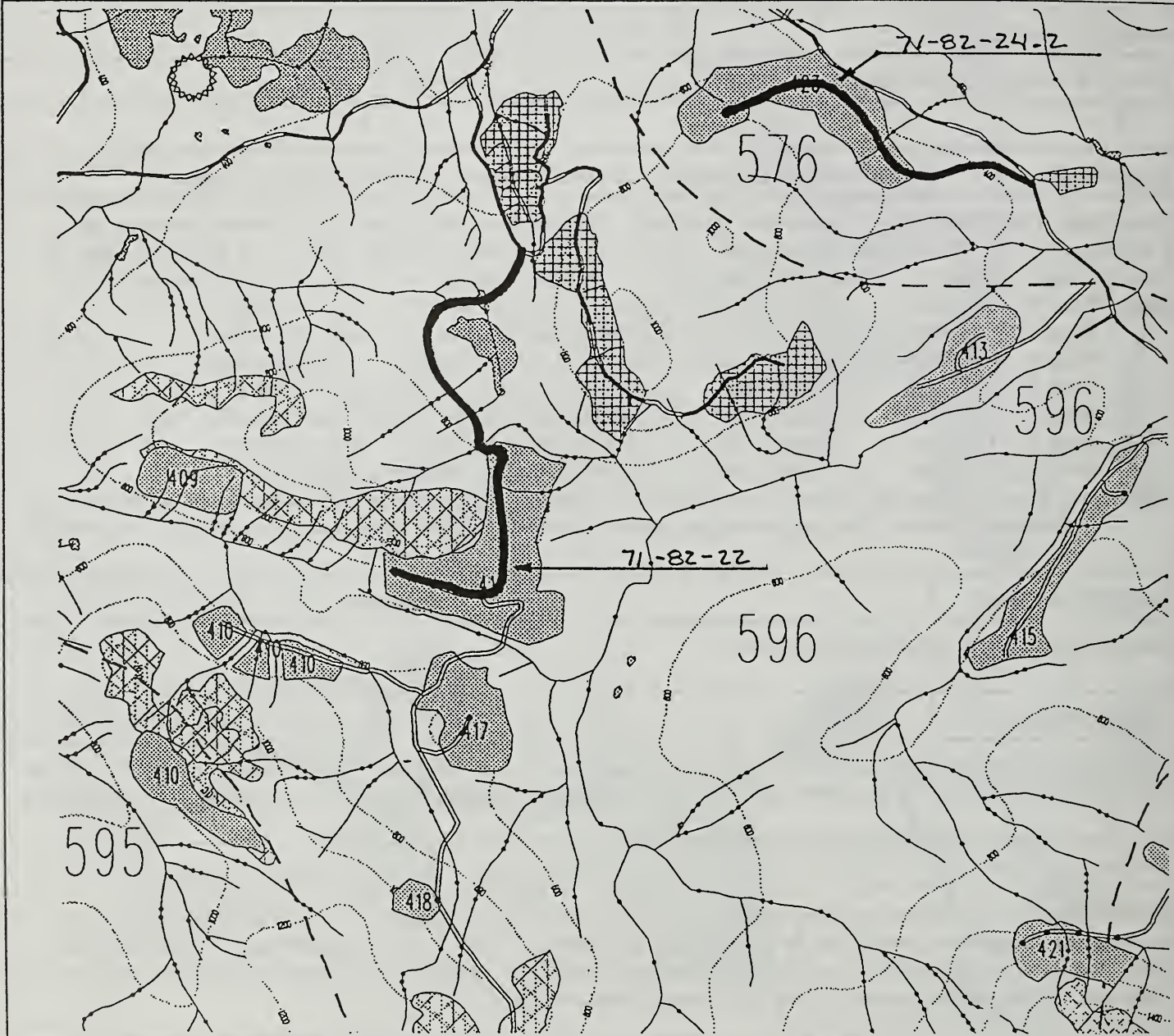
CONTROL LAKE PROJECT ROAD DESIGN CARD

"X"

ROAD : 71-82

VCU : 576/595/596

QUAD : C3NE/NW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "x"

MAIN ROAD #: 71-82-22	VCU: 596	TOTAL LENGTH: 9407 FEET
ROAD CLASS: local, collector	SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>1</u>		
Engineering	Field Review: C. Barnhart, J. Doyal	Office Review: J. Doyal
<p><u>Main Road:</u> Length: 9407'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 2427'; # of "V" Notches: 0; Units Accessed: several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 565'.</p> <p><u>Spurs:</u> The last 1300' of this road is actually a spur.</p> <p>Comments: At the point that 17-82-22 becomes a spur, 71-82-27 becomes the mainline. An alternate route was considered which would access the top of 596-416, but was omitted due to McGilvery soils. The critical grades are 15% favorable.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.		
Soils/Geology		Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "x"

MAIN ROAD #: 71-82-24.2		VCU: 576	TOTAL LENGTH: 5450 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: J. Estebrook, D. Kiester.		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 5450'; Construction: 89% Easy, 11% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 667'; Ft. of Muskeg Crossing: 249'; # of "V" Notches: 0; Units Accessed: 576-423; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 1150'. <u>Spurs:</u> none Comments: The critical grade on this road is 17% favorable. The medium construction occurs in the area of the steep cross slopes which are rock bluffs.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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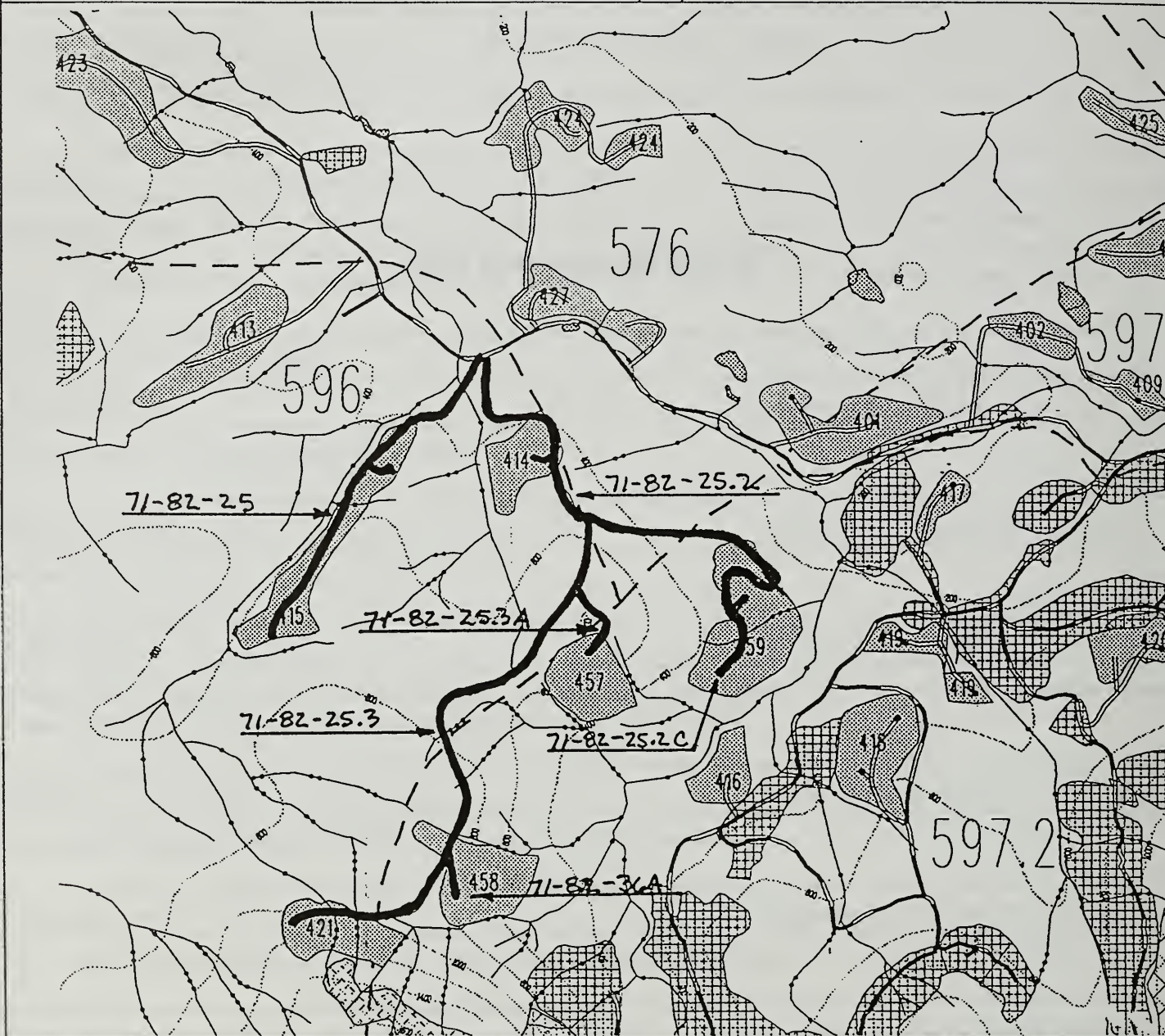
CONTROL LAKE PROJECT ROAD DESIGN CARD

"y"

ROAD : 71-82

VCU : 576/596/597

QUAD : C3NE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 23, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "y"

MAIN ROAD #: 71-82-25		VCU: 596	TOTAL LENGTH: 7550 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 1 </u>			
Engineering	Field Review: R. Stuntzner, M. Hoshal		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 6950'; Construction: 27% Easy, 56% Medium, 17% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 1220'; Ft. of Muskeg Crossing: 100'; # of "V" Notches: 0; Units Accessed: 596-415; # of Quarry Sites: 3; # of Switchbacks: 0; Ft. of Critical Grades: 1780'. <u>Spurs:</u> Road #: 71-82-25.1 Length: 600'; Construction type: easy Comments: Review junction with USFS 30 road. Sight distance may be improved by adjusting the junction location.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area. Build a parking area for 3 to 4 vehicles at the end of the road to unit 596-415.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "y"

MAIN ROAD #: 71-82-25.2		VCU: 596 & 576	TOTAL LENGTH: 9690 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: J. Estebrook, C. Giles		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 7300'; Construction: 37% Easy, 67% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 270'; Ft. of Muskeg Crossing: 635'; # of "V" Notches: 0; Units Accessed: 596-414,597-459 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-82-25.2A Length: 480', Construction type: easy (unit 596-414) Road #: 71-82-25.2B Length: 1690', Construction type: easy (unit 597-459) Road #: 71-82-25.2C Length: 220', Construction type: easy (unit 597-459) Comments: The field engineers noted that a small change in road location within unit 597-459 would give a better road. Look at the unit file before final road layout.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "y"

MAIN ROAD #: 71-82-25.3		VCU: 596 & 597	TOTAL LENGTH: 9086 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: many crews		Office Review: J. Doyal
<p><u>Main Road</u>: Length: 7231'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 610'; # of "V" Notches: 0; Units Accessed: 597-457,458; # of Quarry Sites: 0; # of Switchbacks: 1; Ft. of Critical Grades: 1665'. <u>Spurs</u>: Road #: 71-82-36A, Length: 555', Construction type: easy (unit 597-458) Road #: 71-82-25.3A, Length: 1300', Construction type: easy (unit 597-457) Comments: Field engineers noted that a better location exists than the flagged location. See field notes. Review this road in the field during final layout.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

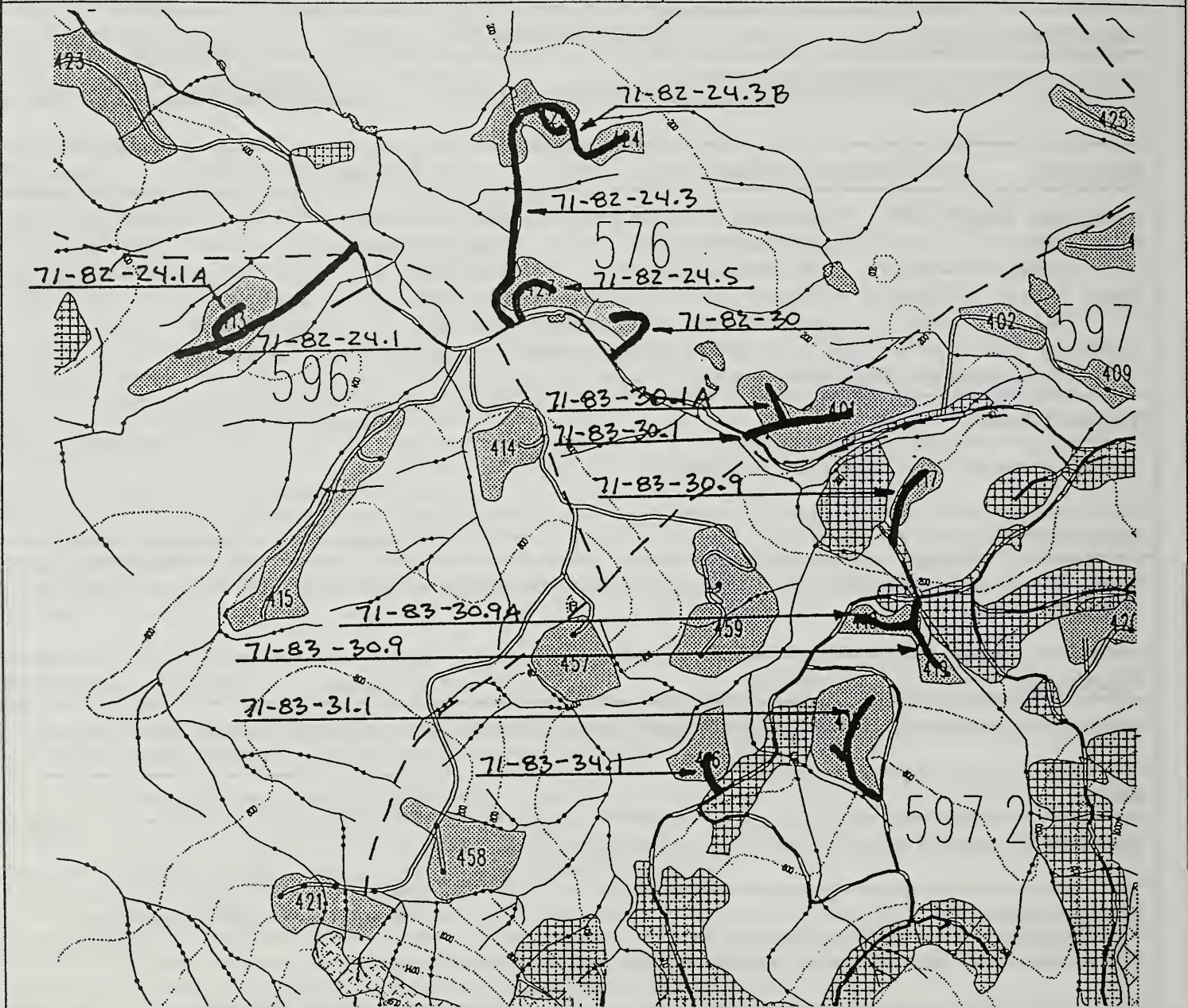
CONTROL LAKE PROJECT ROAD DESIGN CARD

"y"

ROAD : 71-82

VCU : 576/596/597

QUAD : C3NE



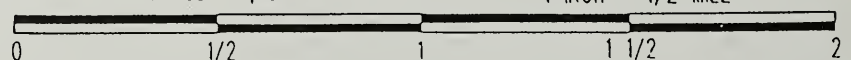
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "y"

MAIN ROAD #: USFS 30		VCU: 576, 596, & 597	TOTAL LENGTH: 14799 FEET																																				
ROAD CLASS: locals		SERVICE LEVEL: D																																					
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit (except encourage on 71-82-24.1A)																																					
TOTAL # STREAM CROSSINGS - CLASS I: <u> 2 </u> - CLASS II: <u> 0 </u>																																							
Engineering	Field Review: Several crews		Office Review: E. Urstadt																																				
<p><u>Main Road:</u> The main road is USFS 30. This is a collection of spurs in the area that are accessed by USFS 30. No work needs to be done to USFS 30.</p> <p><u>Spurs:</u></p> <table border="0"> <tr> <td>Road #: 71-82-24.1</td> <td>Length: 3400'</td> <td>Construction type: easy</td> <td>(unit 596-413)</td> </tr> <tr> <td>Road #: 71-82-24.1A,</td> <td>Length: 800'</td> <td>Construction type: easy</td> <td>(unit 596-413)</td> </tr> <tr> <td>Road #: 71-82-24.5,</td> <td>Length: 1175'</td> <td>Construction type: easy</td> <td>(unit 576-427)</td> </tr> <tr> <td>Road #: 71-83-30,</td> <td>Length: 1180'</td> <td>Construction type: medium</td> <td>(unit 576-427)</td> </tr> <tr> <td>Road #: 71-83-30.1,</td> <td>Length: 1480'</td> <td>Construction type: easy</td> <td>(unit 597-401)</td> </tr> <tr> <td>Road #: 71-83-30.1A,</td> <td>Length: 1020'</td> <td>Construction type: easy</td> <td>(unit 597-401)</td> </tr> <tr> <td>Road #: 71-82-24.3,</td> <td>Length: 4844'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> <tr> <td>Road #: 71-82-24.3A,</td> <td>Length: 300'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> <tr> <td>Road #: 71-82-24.3B,</td> <td>Length: 600'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> </table> <p>Comments: The engineers were instructed to not layout unit 596-413 and its roads because of an adjacent hiking and recreation area. No field data exists and the road/unit is not field verified, but engineers working in the area feel that the road is feasible. 71-82-24.3 is an access road just for unit 576-424. It has 665' of critical (favorable) grades; and it has 2250' of muskeg crossing. This road was positioned to avoid crossing Rio Roberts Creek. The IDT decided to add a setting to 576-424 because it is a logical time to harvest the other setting. The road, which is an extension of 71-82-24.3A, has not been field verified. The first two spur lengths have not been considered in the total. All of these roads can easily be built to access timber quickly.</p>				Road #: 71-82-24.1	Length: 3400'	Construction type: easy	(unit 596-413)	Road #: 71-82-24.1A,	Length: 800'	Construction type: easy	(unit 596-413)	Road #: 71-82-24.5,	Length: 1175'	Construction type: easy	(unit 576-427)	Road #: 71-83-30,	Length: 1180'	Construction type: medium	(unit 576-427)	Road #: 71-83-30.1,	Length: 1480'	Construction type: easy	(unit 597-401)	Road #: 71-83-30.1A,	Length: 1020'	Construction type: easy	(unit 597-401)	Road #: 71-82-24.3,	Length: 4844'	Construction type: easy	(unit 576-424)	Road #: 71-82-24.3A,	Length: 300'	Construction type: easy	(unit 576-424)	Road #: 71-82-24.3B,	Length: 600'	Construction type: easy	(unit 576-424)
Road #: 71-82-24.1	Length: 3400'	Construction type: easy	(unit 596-413)																																				
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Visual/Recreation			Comments by: R. Suttle/M. Greenig																																				
This segment of the road will not be visible from a Priority Travel Route/Use Area.																																							
Other Resources			Comments by: W. Greiser/M. Greenig																																				
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>																																							

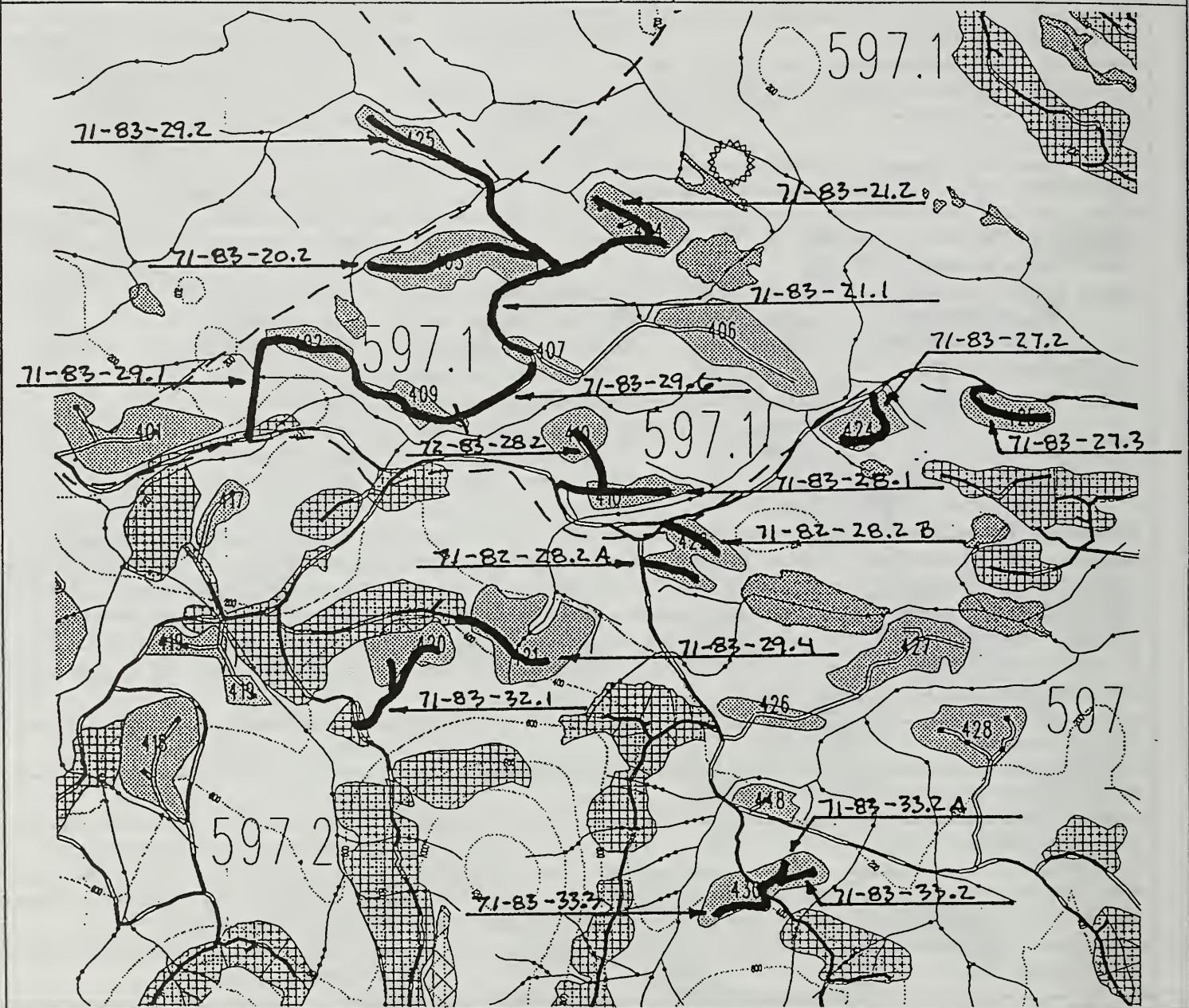
CONTROL LAKE PROJECT ROAD DESIGN CARD

"Z"

ROAD : 71-83

VCU : 576/597.1/597.2

QUAD : C3NE



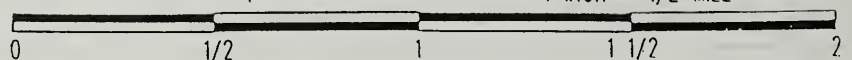
- Revised Control Lake Project Boundary
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- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: spurs-3

square: "z"

MAIN ROAD #: existing USFS		VCU: 597	TOTAL LENGTH: 5615 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit (North of 30 Road), Accept (South of 30 Road)	
TOTAL # STREAM CROSSINGS - CLASS I: ____ 0 ____ - CLASS II: ____ 0 ____			
Engineering	Field Review: Several crews		Office Review: E. Urstadt
<p><u>Main Road:</u> The main road is variuos existing USFS roads. No new work will have to be accomplished on them.</p> <p><u>Spurs:</u> Road #: 71-83-32.1, Length: 1800', Construction type: easy (unit 597-420)</p> <p>Road #: 71-83-29.4, Length: 1520', Construction type: easy (unit 597-421)</p> <p>Road #: 71-83-33.2, Length: 350', Construction type: easy (unit 597-430)</p> <p>Road #: 71-83-33.3, Length: 1800', Construction type: easy (unit 597-430)</p> <p>Road #: 71-83-33.2A, Length: 145', Construction type: easy (unit 597-430)</p> <p>Comments: These are all spurs that start from existing USFS roads. The timber can be accessed quickly if needed.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "z"

MAIN ROAD #: USFS 30		VCU: 576, 596, & 597	TOTAL LENGTH: 14799 FEET																																				
ROAD CLASS: locals		SERVICE LEVEL: D																																					
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit(North of 30 Road); Accept (South of 30 Road)																																					
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>																																							
Engineering	Field Review: Several crews		Office Review: E. Urstadt																																				
<p><u>Main Road:</u> The main road is USFS 30. This is a collection of spurs in the area that are accessed by USFS 30. No work needs to be done to USFS 30.</p> <p><u>Spurs:</u></p> <table border="0"> <tr> <td>Road #: 71-82-24.1</td> <td>Length: 3400'</td> <td>Construction type: easy</td> <td>(unit 596-413)</td> </tr> <tr> <td>Road #: 71-82-24.1A,</td> <td>Length: 800'</td> <td>Construction type: easy</td> <td>(unit 596-413)</td> </tr> <tr> <td>Road #: 71-82-24.5,</td> <td>Length: 1175'</td> <td>Construction type: easy</td> <td>(unit 576-427)</td> </tr> <tr> <td>Road #: 71-83-30,</td> <td>Length: 1180'</td> <td>Construction type: medium</td> <td>(unit 576-427)</td> </tr> <tr> <td>Road #: 71-83-30.1,</td> <td>Length: 1480'</td> <td>Construction type: easy</td> <td>(unit 597-401)</td> </tr> <tr> <td>Road #: 71-83-30.1A,</td> <td>Length: 1020'</td> <td>Construction type: easy</td> <td>(unit 597-401)</td> </tr> <tr> <td>Road #: 71-82-24.3,</td> <td>Length: 4844'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> <tr> <td>Road #: 71-82-24.3A,</td> <td>Length: 300'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> <tr> <td>Road #: 71-82-24.3B,</td> <td>Length: 600'</td> <td>Construction type: easy</td> <td>(unit 576-424)</td> </tr> </table> <p>Comments: The engineers were instructed to not layout unit 596-413 and its roads because of an adjacent hiking and recreation area. No field data exists and the road/unit is not field verified, but engineers working in the area feel that the road is feasible. 71-82-24.3 is an access road just for unit 576-424. It has 665' of critical (favorable) grades; and it has 2250' of muskeg crossing. This road was positioned to avoid crossing Rio Roberts Creek. The IDT decided to add a setting to 576-424 because it is a logical time to harvest the other setting. The road, which is an extension of 71-82-24.3A, has not been field verified. The first two spur lengths have not been considered in the total. All of these roads can easily be built to access timber quickly.</p>				Road #: 71-82-24.1	Length: 3400'	Construction type: easy	(unit 596-413)	Road #: 71-82-24.1A,	Length: 800'	Construction type: easy	(unit 596-413)	Road #: 71-82-24.5,	Length: 1175'	Construction type: easy	(unit 576-427)	Road #: 71-83-30,	Length: 1180'	Construction type: medium	(unit 576-427)	Road #: 71-83-30.1,	Length: 1480'	Construction type: easy	(unit 597-401)	Road #: 71-83-30.1A,	Length: 1020'	Construction type: easy	(unit 597-401)	Road #: 71-82-24.3,	Length: 4844'	Construction type: easy	(unit 576-424)	Road #: 71-82-24.3A,	Length: 300'	Construction type: easy	(unit 576-424)	Road #: 71-82-24.3B,	Length: 600'	Construction type: easy	(unit 576-424)
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Other Resources			Comments by: W. Greiser/M. Greenig																																				
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>																																							

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: 718329.1

square: "z"

MAIN ROAD #: USFS "P" line		VCU: 597 & 576	TOTAL LENGTH: 18245 FEET																																
ROAD CLASS: local, collector		SERVICE LEVEL: C,D																																	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit (North of 30 Road); Accept (South of 30 Road)																																	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>																																			
Engineering	Field Review: Several crews		Office Review: E. Urstadt																																
<p><u>Main Road:</u> The main road is actually a combination of the spurs shown below.</p> <p><u>Spurs:</u></p> <table border="0"> <tr> <td>Road #: 71-83-29.1,</td> <td>Length: 2421',</td> <td>Construction type: easy</td> <td>(unit 597-409)</td> </tr> <tr> <td>Road #: 71-83-29.6,</td> <td>Length: 1835',</td> <td>Construction type: easy</td> <td>(unit 597-407)</td> </tr> <tr> <td>Road #: 71-83-29.6A,</td> <td>Length: 330',</td> <td>Construction type: easy</td> <td>(unit 597-407)</td> </tr> <tr> <td>Road #: 71-83-29.6B,</td> <td>Length: 935',</td> <td>Construction type: easy</td> <td>(unit 597-407)</td> </tr> <tr> <td>Road #: 71-83-21.1,</td> <td>Length: 5163',</td> <td>Construction type: easy</td> <td>(unit 597-404)</td> </tr> <tr> <td>Road #: 71-83-21.2,</td> <td>Length: 361',</td> <td>Construction type: easy</td> <td>(unit 597-404)</td> </tr> <tr> <td>Road #: 71-83-20.2,</td> <td>Length: 2750',</td> <td>Construction type: easy</td> <td>(unit 597-403)</td> </tr> <tr> <td>Road #: 71-83-29.2,</td> <td>Length: 4450',</td> <td>Construction type: easy/medium</td> <td>(unit 576-425)</td> </tr> </table> <p>Comments: 597-402 is accessed by an existing USFS "P" line for which no data was recorded. The road to 597-409 takes off the existing USFS "P" line. Note that the road to unit 597-406 is flagged into the unit from the southeast. The IDT decided to change the road location since a bridge is needed for the original location, but not if accessed as shown. That road has not been field verified.</p>				Road #: 71-83-29.1,	Length: 2421',	Construction type: easy	(unit 597-409)	Road #: 71-83-29.6,	Length: 1835',	Construction type: easy	(unit 597-407)	Road #: 71-83-29.6A,	Length: 330',	Construction type: easy	(unit 597-407)	Road #: 71-83-29.6B,	Length: 935',	Construction type: easy	(unit 597-407)	Road #: 71-83-21.1,	Length: 5163',	Construction type: easy	(unit 597-404)	Road #: 71-83-21.2,	Length: 361',	Construction type: easy	(unit 597-404)	Road #: 71-83-20.2,	Length: 2750',	Construction type: easy	(unit 597-403)	Road #: 71-83-29.2,	Length: 4450',	Construction type: easy/medium	(unit 576-425)
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All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).																																			
Wildlife			Comments by: C. Confer																																
Segment to unit 597-404 is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction. The rest of the road does not approach within 1/2 mile of any known bald eagle nest sites.																																			
Visual/Recreation			Comments by: R. Suttle/M. Greenig																																
This segment of the road will not be visible from a Priority Travel Route/Use Area.																																			
Other Resources	Field Observations: D. Putnam/S. Moorhead		Comments by: W. Greiser/M. Greenig																																
<p>Cultural - No cultural resources encountered along portions of road within unit 576-425; 597.1-404, 405, and 406; and 597.2-425. Remainder of road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>																																			

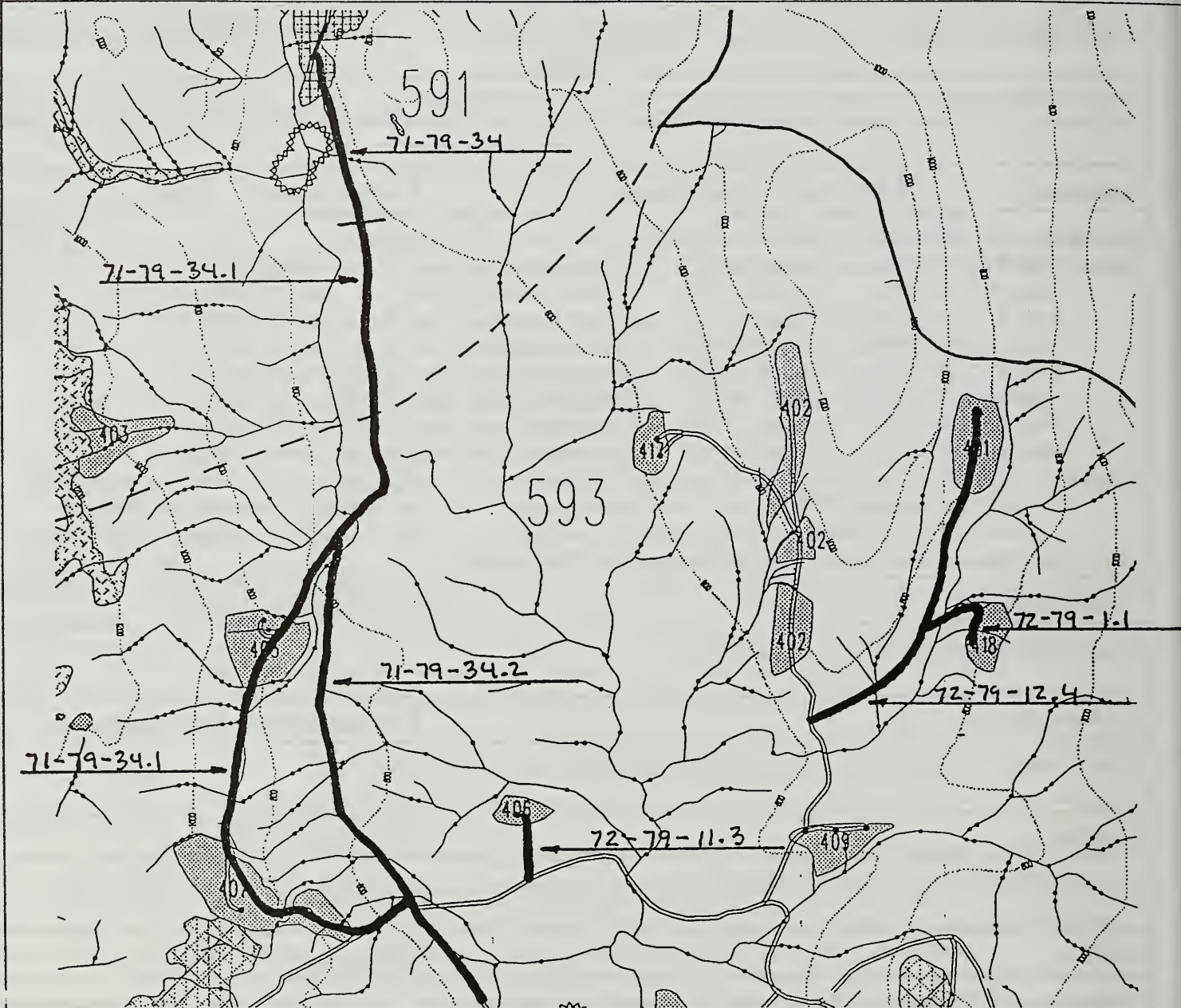
CONTROL LAKE PROJECT ROAD DESIGN CARD

"A"

ROAD : 72-79

VCU : 591/593

QUAD : C4NW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

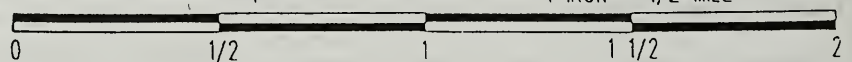
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

W. J. J. J.

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #:71-79-34.1		VCU: 591 & 593	TOTAL LENGTH: 16525 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>4</u>			
Engineering	Field Review: several crews		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 13550'; Construction: 63% Easy, 13% Medium, 24% Difficult; # of >48" Culverts: 1; # of Bridges: 2; Ft. of Cross Slopes >55%: 1050'; Ft. of Muskeg Crossing: 700'; # of "V" Notches: 2; Units Accessed: Several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 2410'.</p> <p><u>Spurs:</u> Road #: 71-79-34.A, Length: 540', Construction type: medium (unit 593-403) Road #: 72-79-10.1 Length: 1435', Construction type: medium (unit 593-407) Road #: 71-79-34 Length: 2070', Construction type: medium Road #: 71-79-34.9 Length: 1000', Construction type: medium (connector road)</p> <p>Comments: 71-79-34 is the beginning of 71-79-34.1. The main road parallels a USFS "P" line. Units 593-403,407 were not be accessed from the USFS "P" line. Engineers suggest that 71-79-34.1 combined with 71-79-34.9 be used instead of a portion of the USFS "P" line. (See 71-79-34.2.) This road loop will be analyzed for the best road location. The small section 71-79-34.9 was not flagged in the field but was field verified.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Northern segment of road is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #:71-79-34.2		VCU: 593	TOTAL LENGTH: 9279 FEET
ROAD CLASS: collector		SERVICE LEVEL: C	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 3 </u> - CLASS II: <u> 3 </u>			
Engineering	Field Review: S. Field		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 9279'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1581'; # of "V" Notches: 0; Units Accessed: Several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 111'.</p> <p><u>Spurs:</u> None</p> <p>Comments: This road is an existing USFS "P" line which was traversed in the early 1980's. It could not be used to access units 593-403,407. It has easy construction and good grades; however, engineers suggest that the portion between 71-79-34.1 and 71-79-34.3 should not be built. This loop will be carefully analyzed to find the final haul route and which segments should be built.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

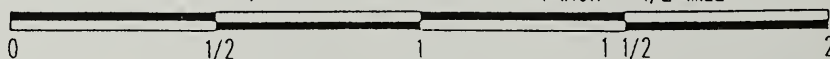
CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #: 72-79-12.4		VCU: 593	TOTAL LENGTH: 9495 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>1</u>			
Engineering	Field Review: B. Wilkinson, J. Graves		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 6350'; Construction: 73% Easy, 10% Medium, 17% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 730'; Ft. of Muskeg Crossing: 1500'; # of "V" Notches: 1; Units Accessed: 593-401,418; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 620'. <u>Spurs:</u> Road #: 72-79-1.1, Length: 1690', Construction type: easy (unit 593-418) Road #: 72-79-11.3, Length: 1455', Construction type: easy to medium (unit 593-406) Comments: The "V" notch noted on the main road is small. The critical grades are favorable. The 72-79-11.3 spur was not extended to the timber north of 493-406 due to excessive construction costs.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

"A"

QUAD : C4NW



August 29, 1934

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #: 72-79-2		VCU: 593	TOTAL LENGTH: 3642 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 1 </u>			
Engineering	Field Review: B. Wilkinson, J. Graves		Office Review: J. Doyal
<p><u>Main Road</u>: Length: 3252'; Construction: 95% Easy, 3% Medium, 2% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 106'; Ft. of Muskeg Crossing: 865'; # of "V" Notches: 1; Units Accessed: 593-417; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 234' <u>Spurs</u>: Road #: 72-79-2.1, Length: 390', Construction type: easy (unit 593-417) Comments: The main road accesses only one unit. The "V" notch is 10' deep and 40' wide. The critical grades are 12% adverse grades.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #: 72-79-11.2		VCU: 593	TOTAL LENGTH: 7750 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>2</u>			
Engineering	Field Review: B. Wilkinson, J. Graves		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 7750'; Construction: 44% Easy, 34% Medium, 22% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 430'; Ft. of Muskeg Crossing: 1130'; # of "V" Notches: 0; Units Accessed: 4-units; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 1880'. <u>Spurs:</u> None Comments: The beginning of the main road has one 50' span bridge. This bridge will be needed to access all four units in the area. (593-401,402,418,417). All of the critical grades are favorable.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). Segment between units 593-409 and 593-402 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "A"

MAIN ROAD #: 72-79-11.5		VCU: 593	TOTAL LENGTH: 2820 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: __0__ - CLASS II: __0__			
Engineering	Field Review: J. Spolar, B. Wilkinson		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 2820'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 100'; # of "V" Notches: 0; Units Accessed: Several; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> The last 820' of this road is actually a spur used only for 593-409 Comments: The first 2000' of this road will serve as a main road to access 5 units. There are no difficult areas of construction on this road.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

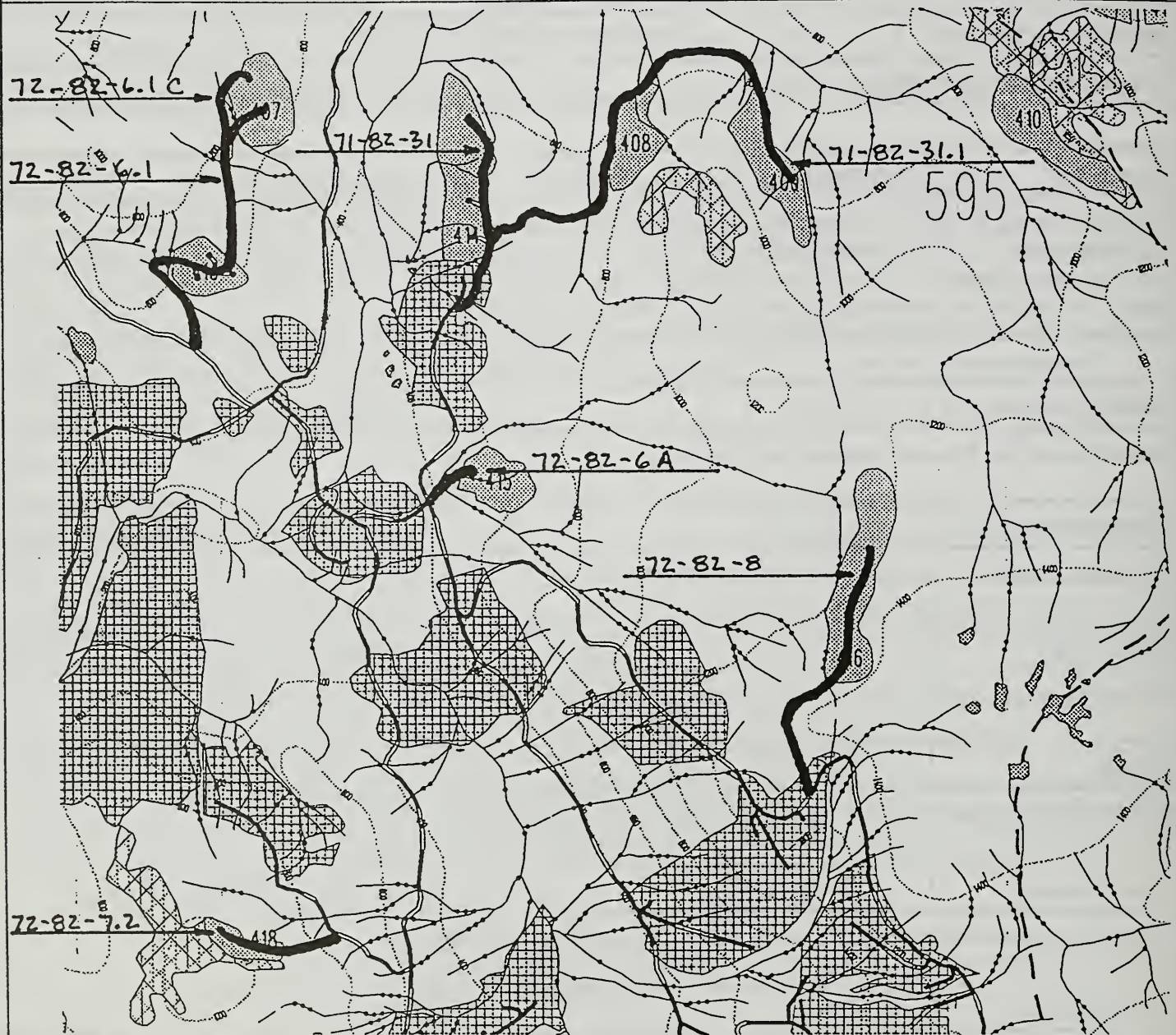
CONTROL LAKE PROJECT ROAD DESIGN CARD

"B"

ROAD : 71-82

VCU : 595

QUAD : C3NW



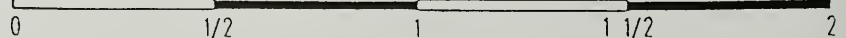
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "B"

MAIN ROAD #: 72-82-6.1		VCU: 595	TOTAL LENGTH: 9216 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 2 </u>			
Engineering	Field Review: J. Doyal, E. Dewilde		Office Review: M. Whitty
<u>Main Road:</u> Length: 7736'; Construction: 92% Easy, 3% Medium, 5% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1081'; # of "V" Notches: 0; Units Accessed: 595-413,407, # of Quarry Sites: 2; # of Switchbacks: 1; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 72-82-6.1C, Length: 960', Construction type: easy (unit 595-407) Road #: 72-82-6.1A, Length: 410', Construction type: medium (unit 595-413) Road #: 72-82-6.1B Length: 110', Construction type: easy (unit 595-413) Comments:			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "B"

MAIN ROAD #: 71-82-31		VCU: 575	TOTAL LENGTH: 12250 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u>3</u> - CLASS II: <u>1</u>			
Engineering	Field Review: several crews		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 3700'; Construction: 63% Easy, 0% Medium, 37% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 3-units; # of Quarry Sites: 4; # of Switchbacks: 0; Ft. of Critical Grades: 1840'. <u>Spurs:</u> Road #: 71-82-31.1 Length: 8550', Construction type: easy (unit 595-408,409) Comments: The first 1700' of the main road will be needed to access 595-408,409. The rest of the main road is essentially a spur for 595-414. The spur road has 1800' of 15% favorable grade; and also 3652' of muskeg crossing. Rock is available on the spur road.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: spurs-4

square: "B"

MAIN ROAD #: existing		VCU: 595	TOTAL LENGTH: 7670 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>1</u>			
Engineering	Field Review: B. Webster, K. Martin		Office Review: K. Jehnke
<p><u>Main Road:</u> The main road is existing USFS roads.</p> <p><u>Spurs:</u> Road #: 72-82-6A, Length: 490', Construction type: medium (unit 595-415)</p> <p>Road #: 72-82-8, Length: 5120', Construction type: easy to medium (unit 595-416)</p> <p>Road #: 72-82-7.2, Length: 2060', Construction type: easy to medium (unit 595-418)</p> <p>Comments: The 72-82-8 road has 3 medium size "V" notch crossings that account for the medium construction. The spur also has 1430' of muskeg crossing. 72-82-7.2 has some full-bench construction, but no blasting is anticipated.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road 72-82-6A drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary. No special concerns for 72-82-8 and 72-82-7.2.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

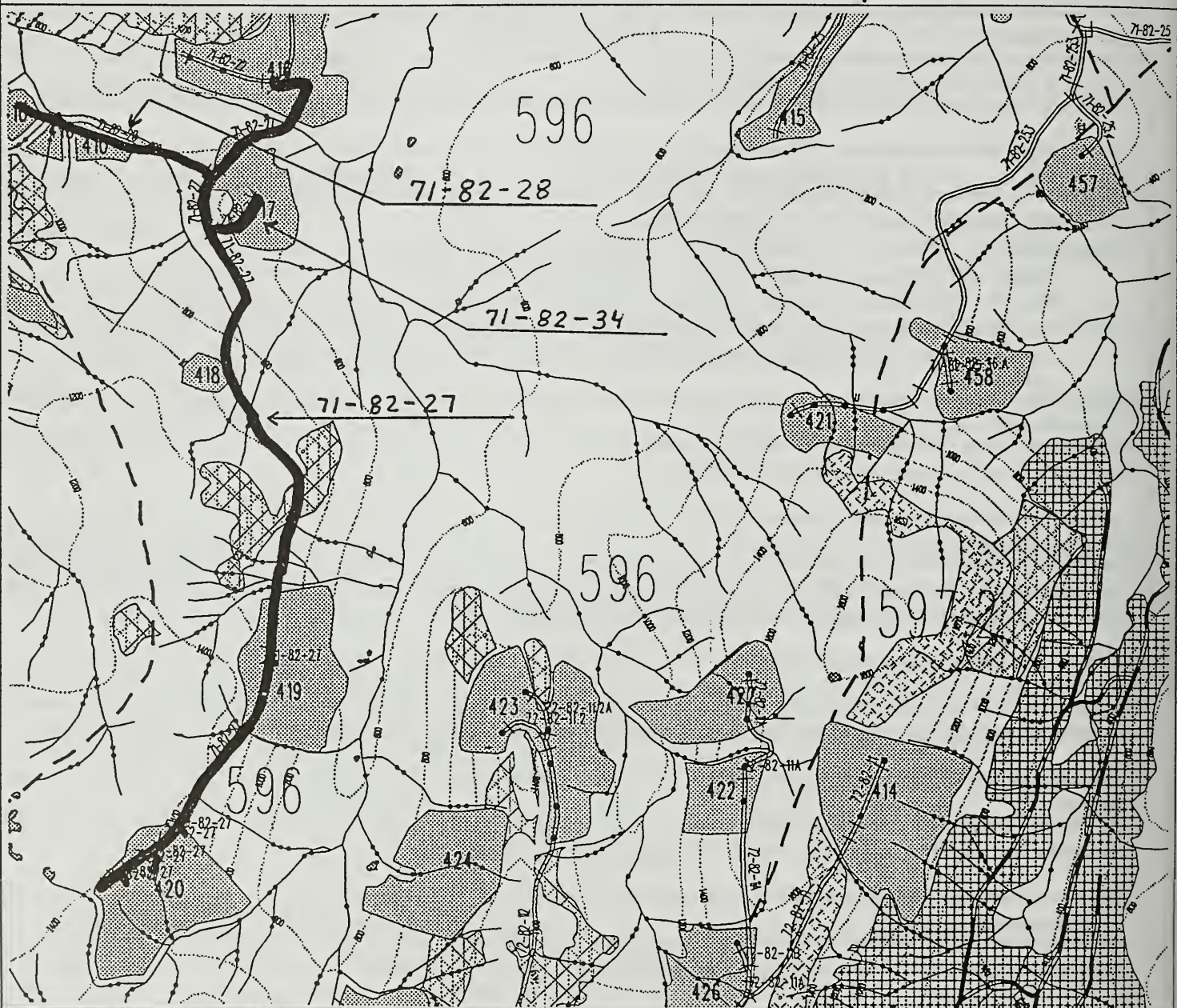
CONTROL LAKE PROJECT ROAD DESIGN CARD

"C"

ROAD : 72-82

VCU : 595

QUAD : C3NW&SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



December 06, 1994

Page 1 of 1

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "C"

MAIN ROAD #: 71-82-27	VCU: 596	TOTAL LENGTH: 25049 FEET
ROAD CLASS: local	SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 2	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 3 </u> - CLASS II: <u> 1 </u>		
Engineering	Field Review: S. Field, B. Flatz	Office Review: J. Doyal
<p>Comments by: J. Boyce Main Road: Length: 18614'; Construction: 58% Easy, 38% Medium, 4% Difficult; # of >48" Culverts: 3;</p> <p># of Bridges: 0; Ft. of Cross Slopes >55%: 509'; Ft. of Muskeg Crossing: 1568'; # of "V" Notches: 1;</p> <p>Units Accessed: 4 units; # of Quarry Sites: 2; # of Switchbacks: 2; Ft. of Critical Grades: 1484'.</p> <p>Spurs: Road #: 71-82-27A, Length: 233', Construction type: easy (unit 596-420)</p> <p>Road #: 71-82-27B, Length: 240', Construction type: easy (unit 596-420)</p> <p>Road #: 71-82-27C, Length: 370', Construction type: easy (unit 596-420)</p> <p>Road #: 71-82-27.5, Length: 336', Construction type: medium (unit 596-419)</p> <p>Road #: 71-82-34, Length: 1245', Construction type: easyum (unit 596-417)</p> <p>Road #: 71-82-28, Length: 4011', Construction type: easyum (unit 596-410)</p> <p>Comments: This road accesses some of the better timber on the project. There is no difficult creek crossings. The landings in 596-419,420 are planned to be used to helicopter log units 596-424,425.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17). Segment between units 596-416 and -417 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.		
Soils/Geology		Comments by: T. Stewart :
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>		

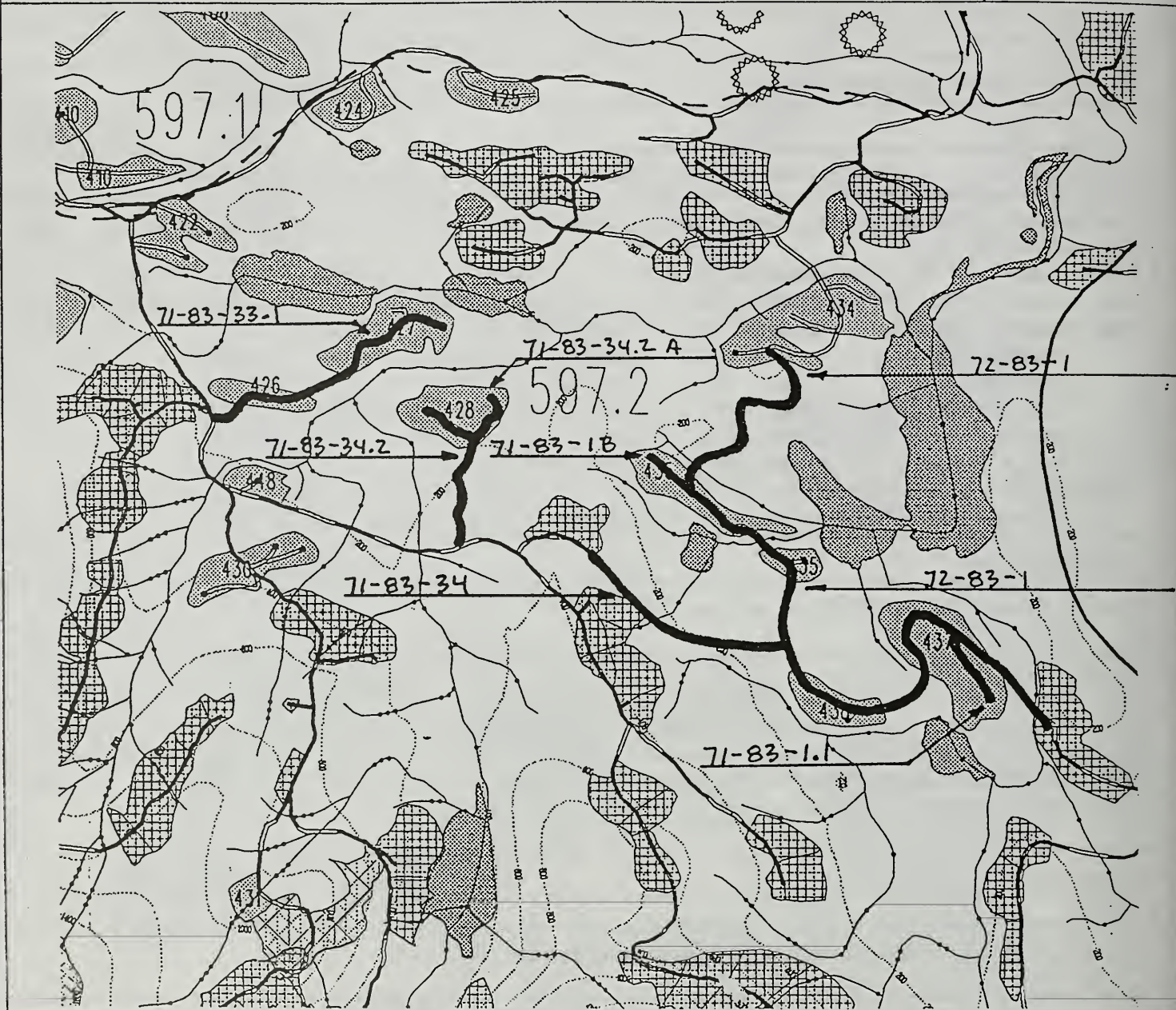
CONTROL LAKE PROJECT ROAD DESIGN CARD

"D"

ROAD : 72-83

VCU : 597.2

QUAD : C2NW/NE



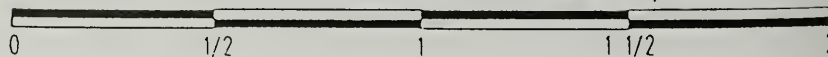
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "D"

MAIN ROAD #: 72-83-1		VCU: 597	TOTAL LENGTH: 16985 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 4 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: Several crews		Office Review: E. Urstadt, M. Whitty
<p><u>Main Road:</u> Length: 15020'; Construction: 64% Easy, 32% Medium, 4% Difficult; # of >48" Culverts: 1; # of Bridges: 1; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 891'; # of "V" Notches: 1; Units Accessed: Several; # of Quarry Sites: 0; # of Switchbacks: 2; Ft. of Critical Grades: 850'. <u>Spurs:</u> Road #: 72-83-1.1, Length: 990', Construction type: easy (unit 597-437) Road #: 72-83-1A, Length: 710', Construction type: easy (unit 597-435) Road #: 72-83-1B, Length: 265', Construction type: easy (unit 597-435) Road #: 71-83-34, Length: XXXX, Construction type: XXXX (unit 5XXXXXX) Comments: The bridge and the first 2000' of the main road can be avoided by hauling out 71-83-34. See also 71-83-26. This road system accesses Angel Lakes. Road 71-83-34 was added to avoid the cost of building the bridges on 72-83-1 and 71-83-26. This road was field verified but field notes were not taken.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Road within unit 597-435 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area. Leave road to unit 597-434 open after completion of harvest. Build parking area for 5 to 6 vehicles near lake.			
Other Resources	Field Review: S. Moorhead		Comments by: W. Greiser/M. Greenig
<p>Cultural - No cultural resources were encountered along portions of road within unit 597-434. Remainder of road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "D"

MAIN ROAD #:71-83-33.1		TOTAL LENGTH: 9882 FEET
ROAD CLASS: local		SERVICE LEVEL: D
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>		
<div>Engineering</div> <div>Field Review: T. Wetzel, J. Herzberg</div> <div>Office Review: J. Doyal</div>		
<p><u>Main Road:</u> Length: 4737'; Construction: 80% Easy, 20% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing:1081'; # of "V" Notches: 0; Units Accessed: 597-426,427 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 175'. <u>Spurs:</u> Road #: 71-83-33.6 Length: 556', Construction type: easy (unit 597-427) Road #: 71-83-34.2, Length: 3326', Construction type: easy (unit 597-428) Road #: 71-83-34.2A, Length: 863', Construction type: easy (unit 597-428) Road #: 71-83-33.4, Length: 400', Construction type: easy (unit 597-448) Comments: 71-83-33.4 is only a small spur off of USFS 3013. The main road comes within 500' of two lakes and could provide access for recreation.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
No special concerns.		
Soils/Geology		Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "D"

MAIN ROAD #: 71-83-34.2		VCU:597	TOTAL LENGTH: 4189 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>0</u>			
Engineering	Field Review: E. Dewilde, J. Herrzberg		Office Review: K. Jehnke
<p><u>Main Road:</u> Length: 3326'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 597-428; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-83-34.2A, Length: 863', Construction type: easy (unit 597-428) Comments: The main road accesses only one unit. The road has mild grades and easy construction.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

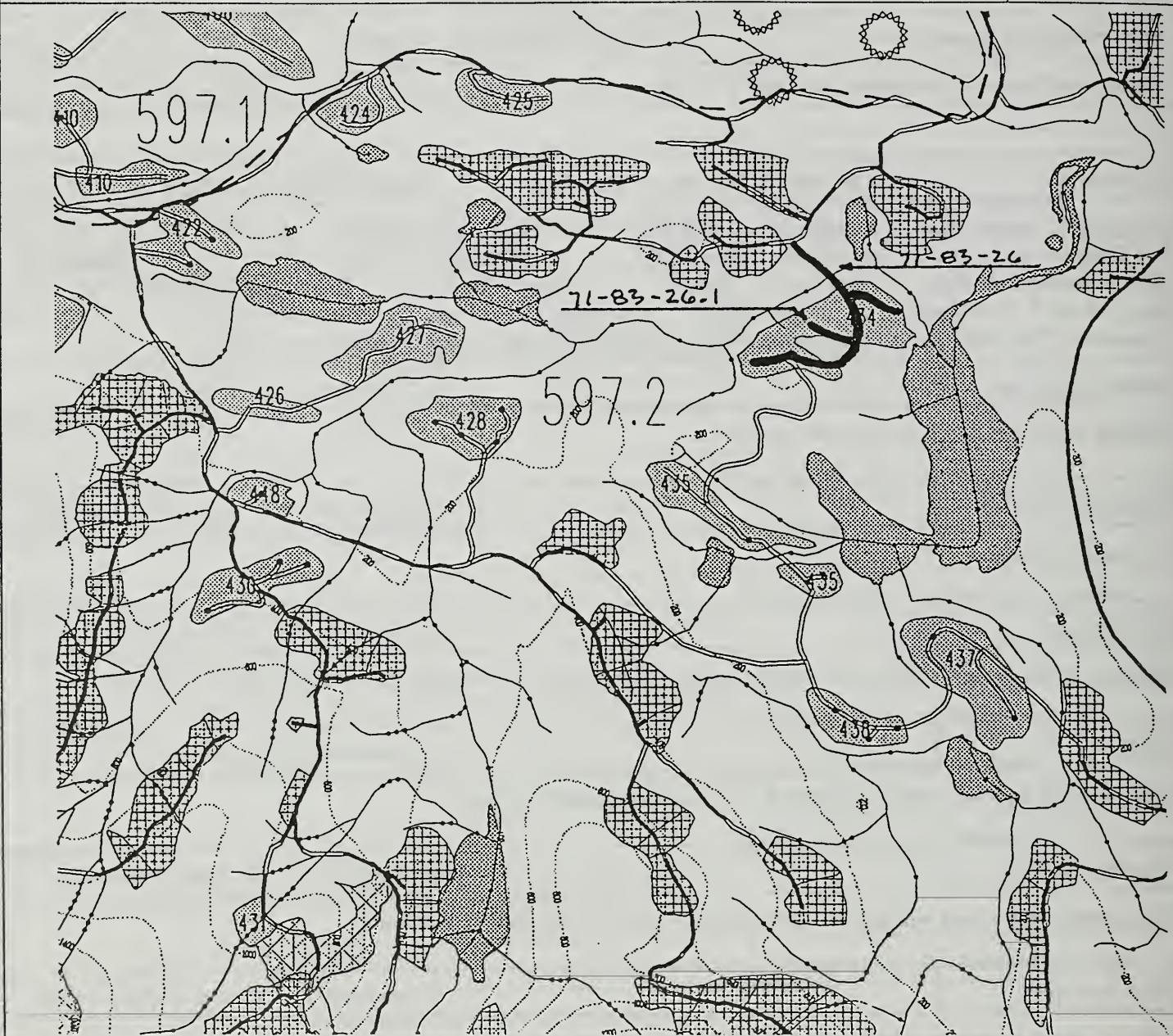
CONTROL LAKE PROJECT ROAD DESIGN CARD

"D"

ROAD : 72-83

VCU : 5972

QUAD : C2NW/NE



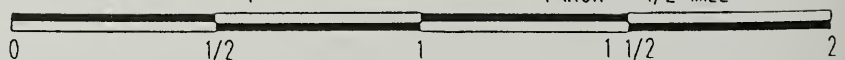
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "D"

MAIN ROAD #: 71-83-26		VCU: 597	TOTAL LENGTH: 4850 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>1</u> - CLASS II: <u>0</u>			
Engineering			
Field Review: T. Wetzel, D. Foster		Office Review: M. Whitty	
<p><u>Main Road:</u> Length: 3650'; Construction: 71% Easy, 29% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 597-434; # of Quarry Sites: 0; # of Switchbacks: 1; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-83-26.1 Length: 1200', Construction type: easy (unit 597-434) Comments: The bridge and the medium construction can be eliminated by hauling out 72-83-1 and 71-83-34. Note that this would require 5000' of additional construction. The transportation network will analyze for the best haul route. See 72-83-1 for more information.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology		Comments by: T. Stewart	
<p>All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).</p>			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

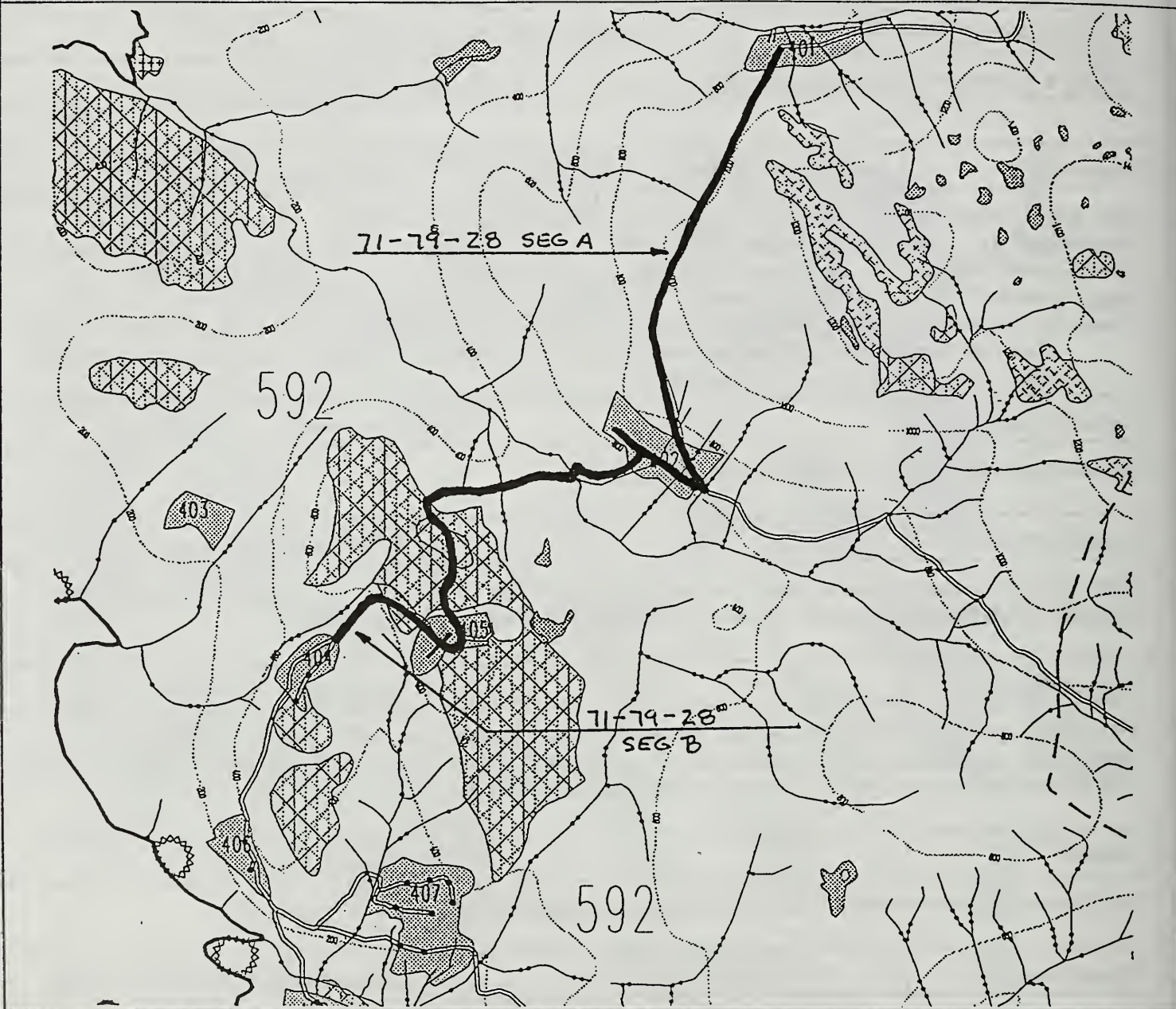
CONTROL LAKE PROJECT ROAD DESIGN CARD

"E"

ROAD : 71-79

VCU : 592

QUAD : C4NW/SW-C5NE



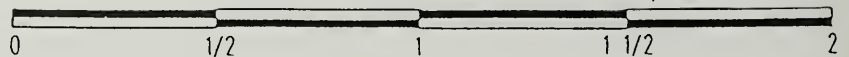
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MML 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square "E"

MAIN ROAD #: 71-79-28		VCU: 592	TOTAL LENGTH: 5,940 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: 1 - CLASS II: 2			
Engineering	Field Review:		Office Review: E. Urstadt, K. Jehnke
<p><u>Main Road:</u> Length: 5,40'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: X-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 71-79-28, Length: 3,300', Construction type: easy (unit 592-402) Road #: 71-79-28, Length: 2,640', Construction type: easy (unit 592-405)</p> <p>Comments: Road is next to Semi-Primitive Recreation Area. Final road location will need to be surveyed to ensure that it is outside that boundary.</p>			
Timber/Silviculture			Office Review: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Office Review: J. Knutzen/T.Stewart
Class I stream crossing requires a construction timing windows of July 18 to August 15. Road crosses Class II streams. No timing restriction necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17)			
Soils/Geology			Office Review: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Office Review: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nests.			
Visual/Recreation			Office Review: R. Suttle/M.Greenig
The road will not be visible from any Priority Travel Route/Use Area.			
Other Resources			Office Review: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No stands/private encumbered lands occur adjacent to road. Road is adjacent to Semi-Primitive recreation area.</p>			

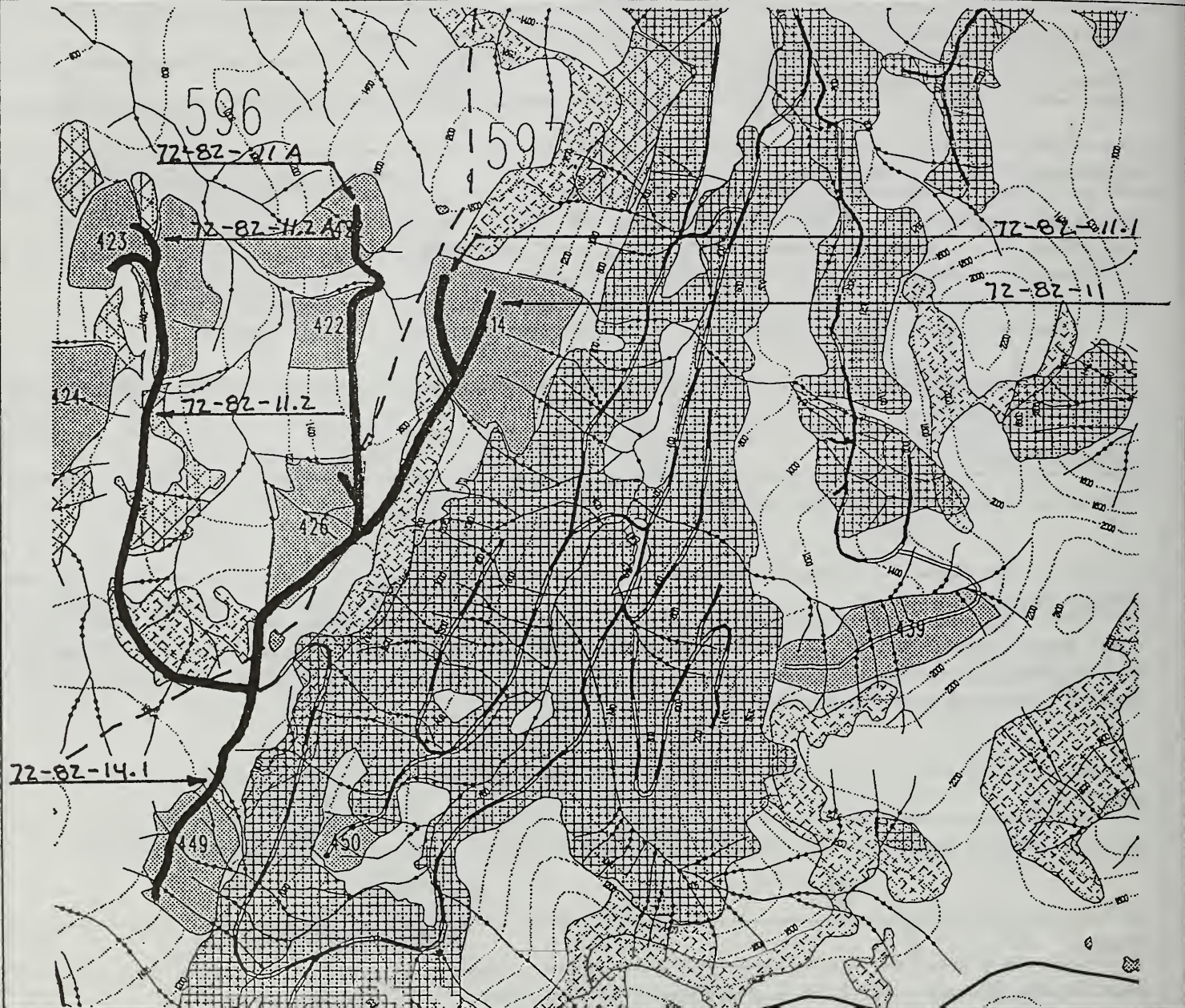
CONTROL LAKE PROJECT ROAD DESIGN CARD

"F"

ROAD : 72-82

VCU : 596/597.2

QUAD : C3NE/SE



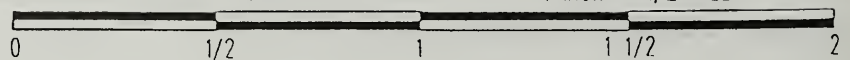
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "F"

MAIN ROAD #: 72-82-11		VCU: 596 & 597	TOTAL LENGTH: 11330 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: J. Estebrook, C. Giles		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 9770'; Construction: 86% Easy, 14% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 1320'; Ft. of Muskeg Crossing: 2000'; # of "V" Notches: 1; Units Accessed: Several; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 440'. <u>Spurs:</u> Road #: 72-82-11.1 Length: 1560'; Construction type: easy (unit 597-414) Comments: The main road takes off of an existing USFS road. The USFS road will require considerable reconstruction. The critical grades are favorable. Watch for glacial till and McGilvery soils in this area.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "F"

MAIN ROAD #: 72-82-11.A		VCU: 596	TOTAL LENGTH: 4860 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 1 </u>			
Engineering	Field Review: J. Estebrook, C. Giles		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 4600'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 1041'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 1; Units Accessed: 596-422,426 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 433'. <u>Spurs:</u> Road #: 72-82-11B, Length: 260', Construction type: easy (unit 596-426) Comments: A trial grade was placed down the center of the large ridge. That location would require several short spurs out East and West slopes where merchantable timber exists. We decided that a road on each side of the ridge would access the most timber and require less road construction in the long run. The present location will avoid the muskeg-type ridgetop and allow that area to be undisturbed. The main road on this side of the ridge was placed on the shoulder of the slope where it is logical to yard from. See 72-82-11.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "F"

MAIN ROAD #: 72-82-11.2		VCU: 596	TOTAL LENGTH: 15036 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review:		Office Review: E. Urstadt, K. Jehnke
<p><u>Main Road:</u> Length: 9522'; Construction: 74% Easy, 12% Medium, 14% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 1015'; Ft. of Muskeg Crossing: 4287'; # of "V" Notches: 1; Units Accessed: 596-423; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> Road #: 72-82-11.2A, Length: 893', Construction type: easy to medium (unit 596-423) Road #: 72-82-14.1, Length: 4621', Construction type: medium (unit 597-449) Comments: The main road on this road card is only needed to access 596-423. This road will require a considerable amount of reconstruction. (See 72-82-11 roadcard) Watch for glacial till and McGilvery soils in this area. This is a long road compared to the amount of timber accessed.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

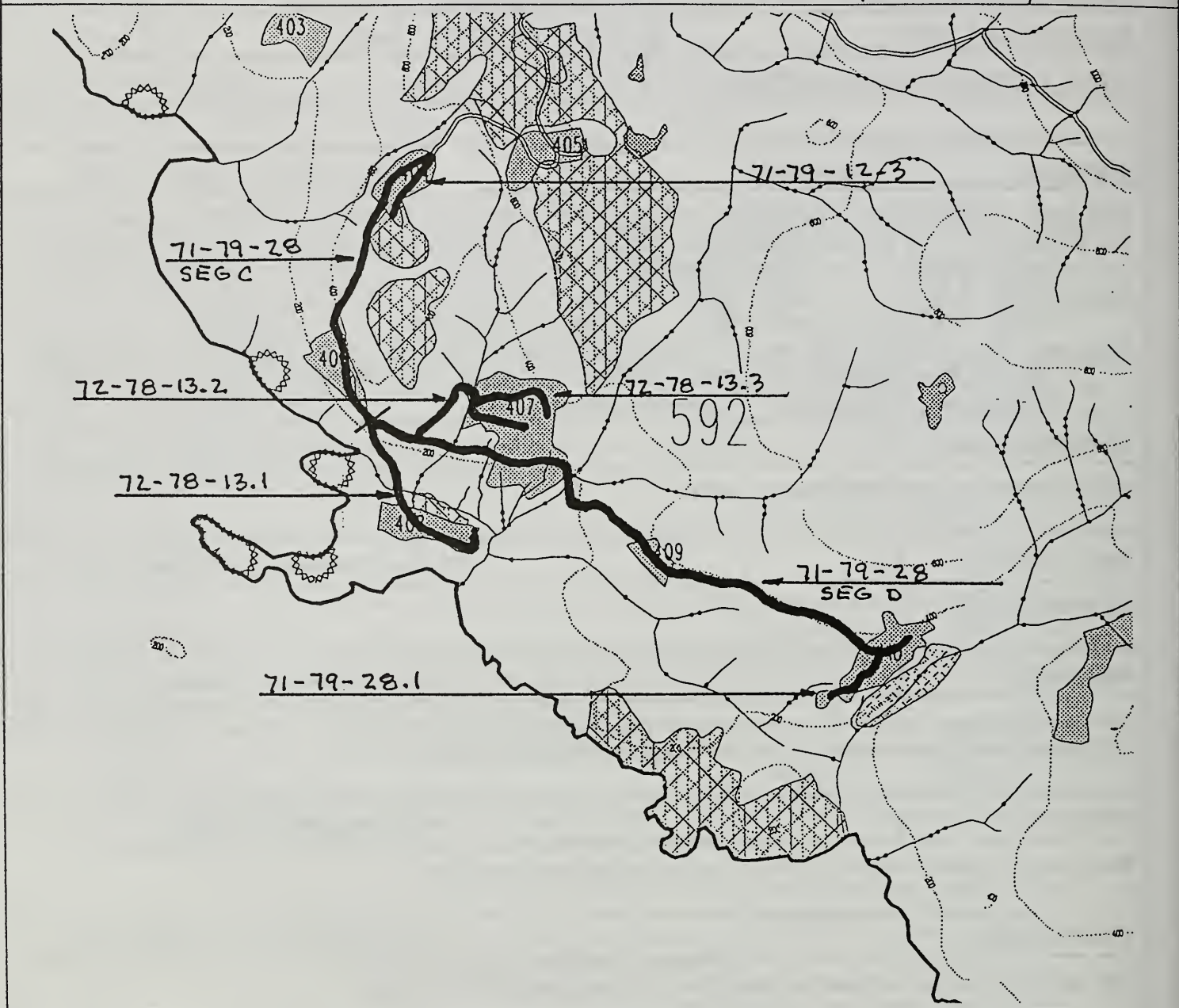
CONTROL LAKE PROJECT ROAD DESIGN CARD

"G"

ROAD : 71-79

VCU : 592

QUAD : C4SW-C5NE/SE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

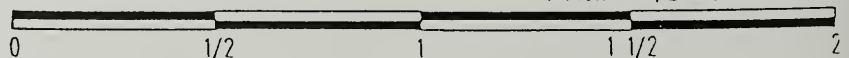
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

Revised

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "G"

MAIN ROAD #: 71-79-28 Seg. C		VCU: 592	TOTAL LENGTH: 5455 FEET
ROAD CLASS: collector		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: T. Hoshal		Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 4000'; Construction: 56% Easy, 22% Medium, 22% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 1145'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 6-units; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 1800'.</p> <p><u>Spurs:</u> Road #: 71-79-12.3, Length: 1455', Construction type: easy (unit 592-404)</p> <p>Comments: This road has areas of drill & shoot which make up the difficult construction sections. Maximum grades were attempted to avoid these bluff areas but the alternate locations required full bench construction as well. The field engineer thought that a gentle grade of 5% through the rock outcrops was the best road location. Consider helicopter logging to water to avoid high road construction costs. (See 71-79-28 Seg. A & B)</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Portion of road is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Within "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "G"

MAIN ROAD #: 71-79-28 Seg. D		VCU: 592	TOTAL LENGTH: 21950 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>4</u> - CLASS II: <u>1</u>			
Engineering	Field Review: E. Dewilde, T Hoshal,		Office Review: E. Urstadt
<p><u>Comments by: J. Boyce</u> Main Road: Length: 13033'; Construction: 85% Easy, 8% Medium, 7% Difficult; # of >48" Culverts: 0;</p> <p># of Bridges: 1; Ft. of Cross Slopes >55%: 733'; Ft. of Muskeg Crossing: 1044'; # of "V" Notches: 0;</p> <p>Units Accessed: 3-units; # of Quarry Sites: 4; # of Switchbacks: 1; Ft. of Critical Grades: 1750'.</p> <p><u>Spurs:</u> Road #: 72-73-13.3 Length: 1622', Construction type: easy (unit 592-407)</p> <p>Road #: 72-78-13.2 Length: 2985', Construction type: easy (unit 592-407)</p> <p>Road #: 72-78-13.1 Length: 2840', Construction type: easy to medium (unit 592-408)</p> <p>Road #: 71-79-28.1 Length: 1470', Construction type: easy (unit 592-410)</p> <p>Comments: The road was extensively reconned for a good road crossing. The bridge is at the only feasible river crossing. Timing may be critical for the bridge construction due to a major salmon run. A temporary bridge is recommended. Consider helicopter logging to water to avoid road construction costs.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Segment 72-78-13.1 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Segment 72-78-13.1 is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Units 592-407 and -410 are within the "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone. Unit 592-408 is also within the "West Coast Waterway" Viewshed. Modification VQO. Foreground Distance Zone. Minimize contrast with surrounding landscape through cleanup following Project completion.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources.			
Lands - No state/private encumbered lands occur adjacent to the road.			

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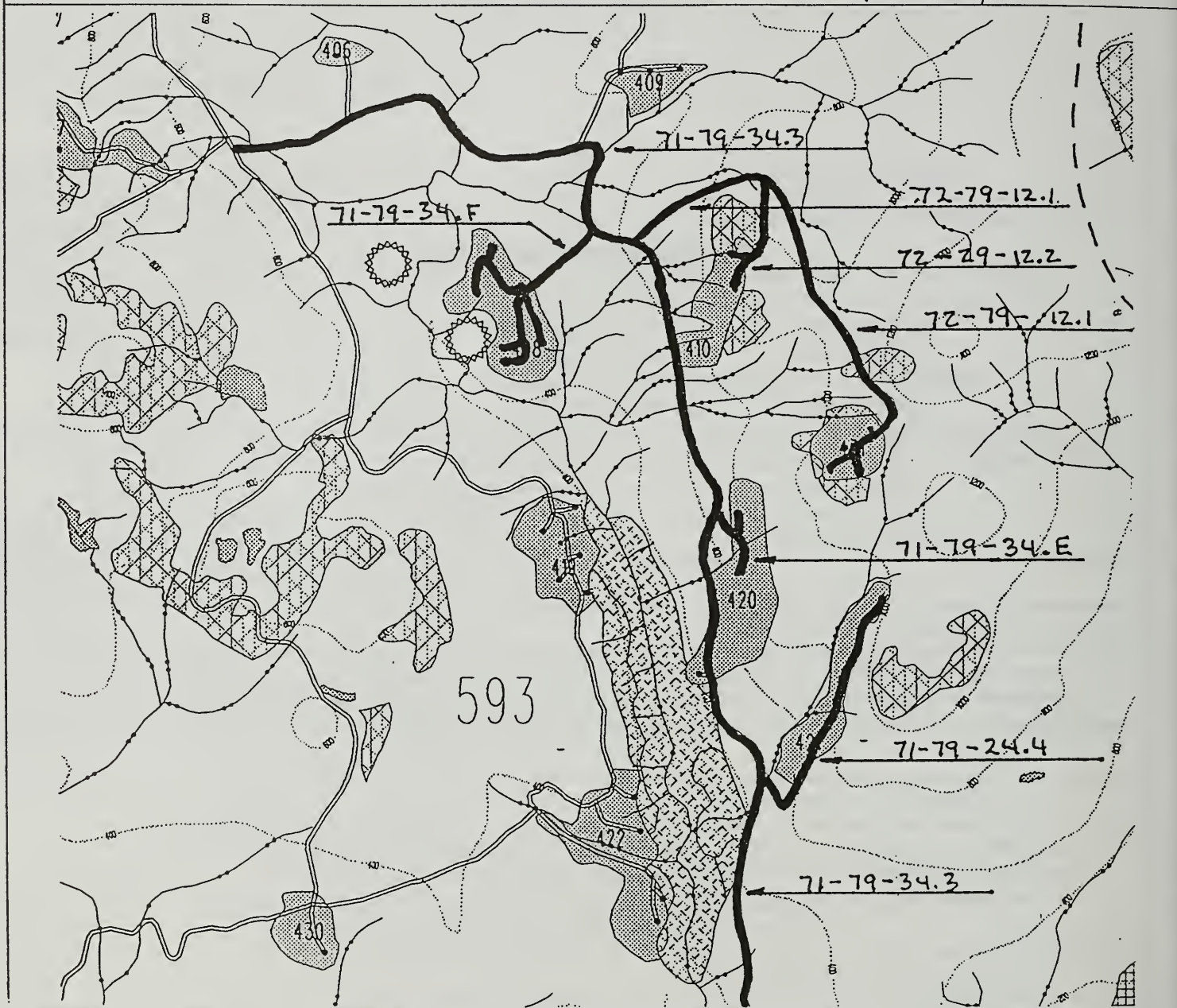
CONTROL LAKE PROJECT ROAD DESIGN CARD

"H"

ROAD : 72-79

VCU : 593

QUAD : C4NW/SW



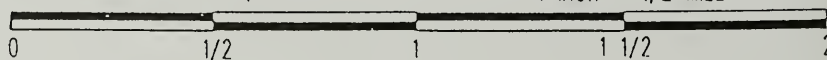
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "H"

MAIN ROAD #: 72-79-12.1		VCU: 593	TOTAL LENGTH: 12300 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: ____0____ - CLASS II: ____0____			
Engineering	Field Review: J. Spolar, B. Wilkinson		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 7120'; Construction: 84% Easy, 16% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 3590'; # of "V" Notches: 0; Units Accessed: 593-410,431 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 2215'. <u>Spurs:</u> Road #: 72-79-12.2, Length: 2100', Construction type: easy to medium (unit 593-410) Road #: 72-79-12.3, Length: 360', Construction type: medium (unit 593-410) Road #: 72-79-13.1, Length: 1830', Construction type: easy to medium (unit 593-431) Road #: 72-79-13.2, Length: 300', Construction type: easy (unit 593-431) Road #: 72-79-13.3, Length: 470', Construction type: easy to medium (unit 593-431) Road #: 72-79-13.4, Length: 120', Construction type: easy (unit 593-431) Comments: The critical grades on the main road are favorable grades. The main road was originally intended to access 593-421. A better road to 593-421 was found. As a result the last 800' of the main road will not be needed.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
Units 593-410 and -431 are within the "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "H"

MAIN ROAD #: 71-79-34.3	VCU: 593	TOTAL LENGTH: 27025 FEET
ROAD CLASS: local, collector	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1,2	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>3</u> - CLASS II: <u>0</u>		
Engineering	Field Review: M. Hoshal, B. Flatz	Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 27025'; Construction: 60% Easy, 40% Medium, 0% Difficult; # of >48" Culverts: 3; # of Bridges: 2; Ft. of Cross Slopes >55%: 95'; Ft. of Muskeg Crossing: 2388'; # of "V" Notches: 5; Units Accessed: 6-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 635'. <u>Spurs:</u> None Comments: This road is an existing USFS "P" line and is in a good location. There is five "V" notches of considerable size; although all are less than 20' deep. The southernmost section of the road accesses 593-424 and is on road card map "D".</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Road crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.		
Soils/Geology		Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).		
Wildlife		Comments by: C. Confer
Northernmost section of this road is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: spurs-5

square: "H"

MAIN ROAD #: Spurs		VCU:593	TOTAL LENGTH: 5310 FEET																												
ROAD CLASS: local		SERVICE LEVEL: D																													
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit																													
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>0</u>																															
Engineering	Field Review: Several crews		Office Review: E. Urstadt, K. Jehnke																												
<p><u>Main Road:</u> The main road is 72-79-34.3.</p> <p><u>Spurs:</u></p> <table border="0"> <tr> <td>Road #: 71-79-34.D,</td> <td>Length: 1345',</td> <td>Construction type: easy</td> <td>(unit 593-420)</td> </tr> <tr> <td>Road #: 71-79-34.E,</td> <td>Length: 890',</td> <td>Construction type: easy</td> <td>(unit 593-420)</td> </tr> <tr> <td>Road #: 71-79-34.F,</td> <td>Length: 285',</td> <td>Construction type: easy</td> <td>(unit 593-420)</td> </tr> <tr> <td>Road #: 72-79-24.4</td> <td>Length: 190',</td> <td>Construction type: easy</td> <td>(unit 593-421)</td> </tr> <tr> <td>Road #: 71-79-34.E,</td> <td>Length: 900',</td> <td>Construction type: easy</td> <td>(unit 593-408)</td> </tr> <tr> <td>Road #: 71-79-34.D,</td> <td>Length: 1200',</td> <td>Construction type: medium</td> <td>(unit 593-408)</td> </tr> <tr> <td>Road #: 71-79-34.C,</td> <td>Length: 500',</td> <td>Construction type: medium</td> <td>(unit 593-408)</td> </tr> </table> <p>Comments: These are a set of spurs that are all accessed from 72-79-34.3 (an existing USFS "P" line). The last 3 spurs are field verified but not flagged. Note: there are duplicate road numbers. The roads are for different units and therefore will not get easily confused.</p>				Road #: 71-79-34.D,	Length: 1345',	Construction type: easy	(unit 593-420)	Road #: 71-79-34.E,	Length: 890',	Construction type: easy	(unit 593-420)	Road #: 71-79-34.F,	Length: 285',	Construction type: easy	(unit 593-420)	Road #: 72-79-24.4	Length: 190',	Construction type: easy	(unit 593-421)	Road #: 71-79-34.E,	Length: 900',	Construction type: easy	(unit 593-408)	Road #: 71-79-34.D,	Length: 1200',	Construction type: medium	(unit 593-408)	Road #: 71-79-34.C,	Length: 500',	Construction type: medium	(unit 593-408)
Road #: 71-79-34.D,	Length: 1345',	Construction type: easy	(unit 593-420)																												
Road #: 71-79-34.E,	Length: 890',	Construction type: easy	(unit 593-420)																												
Road #: 71-79-34.F,	Length: 285',	Construction type: easy	(unit 593-420)																												
Road #: 72-79-24.4	Length: 190',	Construction type: easy	(unit 593-421)																												
Road #: 71-79-34.E,	Length: 900',	Construction type: easy	(unit 593-408)																												
Road #: 71-79-34.D,	Length: 1200',	Construction type: medium	(unit 593-408)																												
Road #: 71-79-34.C,	Length: 500',	Construction type: medium	(unit 593-408)																												
Timber/Silviculture			Comments by: J. Boyce																												
Maintain access for future silvicultural activities.																															
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart																												
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).																															
Soils/Geology			Comments by: T. Stewart																												
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).																															
Wildlife			Comments by: C. Confer																												
Road for unit 593-408 is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction. Roads for other units do not approach within 1/2 mile of any known bald eagle nest sites.																															
Visual/Recreation			Comments by: R. Suttle/M. Greenig																												
Unit 593-420 is within the "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.																															
Other Resources			Comments by: W. Greiser/M. Greenig																												
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>																															

CONTROL LAKE PROJECT ROAD DESIGN CARD

"H"

ROAD : 72-79

VCU : 593

QUAD : C4NW/SW



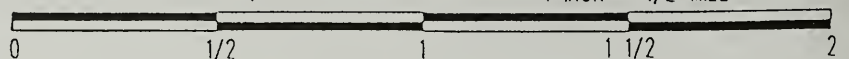
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 29, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "H"

MAIN ROAD #: 72-79-14		VCU: 593	TOTAL LENGTH: 13793 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>2</u>			
Engineering	Field Review: S. field, B. Flatz		Office Review: M. Whitty
<p><u>Main Road:</u> Length: 13793'; Construction: 94% Easy, 6% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 731'; Ft. of Muskeg Crossing: 3174'; # of "V" Notches: 0; Units Accessed: 3-units; # of Quarry Sites: 2; # of Switchbacks: 0; Ft. of Critical Grades: 1246'.</p> <p><u>Spurs:</u> The last 734' is a spur for 593-430.</p> <p>Comments: This road is part of a road loop that will be analyzed for the final haul route. This road was designed partly to access 593-428, -429, which were dropped because of low volume. An alternate road that accessed more timber was flagged, forming the other part of the loop. (See 71-79-35.5). The last 734 feet of this road is a spur for unit 593-430. Except for that last 734 feet, this road is not economical.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "H"

MAIN ROAD #: 71-79-34.2 Seg.B		VCU: 593	TOTAL LENGTH: 2304 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>0</u>			
Engineering	Field Review: B. Wilkinson, J Graves		Office Review: E. Urstadt
<p>Main Road: Length: 18657'; Construction: 81% Easy, 11% Medium, 8% Difficult; # of >48" Culverts: 3; # of Bridges: 0; Ft. of Cross Slopes >55%: 480'; Ft. of Muskeg Crossing: 2087'; # of "V" Notches: 1; Units Accessed: Several; # of Quarry Sites: 1; # of Switchbacks: 0; Ft. of Critical Grades: 753'.</p> <p>Spurs: Road #: 72-79-19.1 Length: 123', Construction type: easy (unit 593-419) Road #: 72-79-19.2 Length: 200', Construction type: easy (unit 593-419) Road #: 72-79-19.3 Length: 230', Construction type: easy (unit 593-419) Road #: 72-79-24.1 Length: 400', Construction type: easy (unit 593-422) Road #: 72-79-24.2 Length: 828', Construction type: easy (unit 593-422) Road #: 72-79-24.3 Length: 523', Construction type: easy (unit 593-422)</p> <p>Comments: Most of the critical grades on the main road are favorable grades. The main road is an old USFS "P" line. The spurs in unit 593-419 were reviewed during a quality control check, and some minor changes were made. The last three spurs listed on this card are field verified but not flagged.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
<p>Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Segment to unit 593-419 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.</p>			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Northern segment of road is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "H"

MAIN ROAD #: 71-79-35.5	VCU: 593	TOTAL LENGTH: 4200 FEET
ROAD CLASS: local	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>		
Engineering	Field Review: s. Field, T. Wetzel	Office Review: E. Urstadt
<p><u>Main Road:</u> Length: 4200'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 2-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 0'. <u>Spurs:</u> None Comments: This road was flagged in as an alternate to 71-79-14. This road is part of a loop that will be analyzed for final haul route. This road is shorter and has easier construction than 71-79-14. This road is entirely in scrubby timber and muskeg type ground. Grades are around 5% and cross slopes average 15%.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
No special concerns.		
Soils/Geology		Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

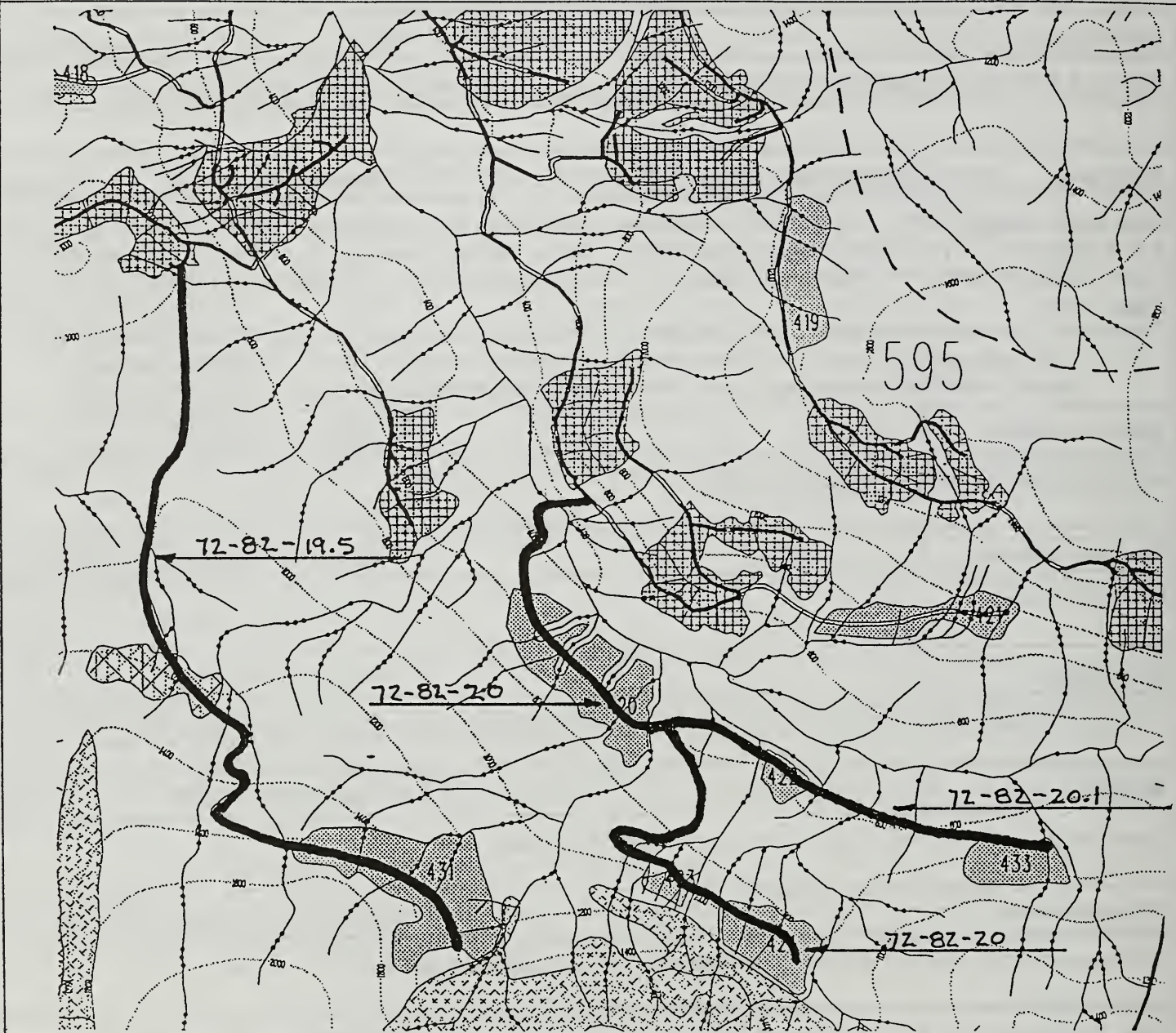
CONTROL LAKE PROJECT ROAD DESIGN CARD

"I"

ROAD : 72-82

VCU : 595

QUAD : C3NE/NW/SE/SW



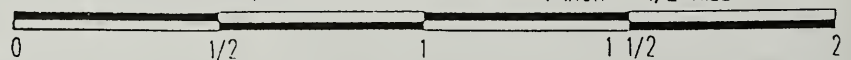
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "I"

MAIN ROAD #: 72-82-19.5	VCU: 595	TOTAL LENGTH: 8874 FEET
ROAD CLASS: local	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1	ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 1 </u>		
Engineering	Field Review: J. Doyal, J. Herzberg	Office Review: C. Barnhart
<p><u>Main Road:</u> Length: 8874'; Construction: 84% Easy, 0% Medium, 16% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 1171'; Ft. of Muskeg Crossing: 4425'; # of "V" Notches: 1; Units Accessed: 595-431; # of Quarry Sites: 1; # of Switchbacks: 3; Ft. of Critical Grades: 139'. <u>Spurs:</u> None Comments: This is a long road which accesses only one unit. This road has three 70' radius switchbacks, which have favorable grades. Half of the road is in muskeg, and the 60" culvert will require 25' of fill. Rock is available for fill material. Check the economic feasibility of this road. Consider helicopter logging to avoid road costs.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).		
Soils/Geology		Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "I"

MAIN ROAD #: 72-82-20		VCU: 595	TOTAL LENGTH: 15492 FEET
ROAD CLASS: local, collector		SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1,2		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u>0</u> - CLASS II: <u>2</u>			
Engineering	Field Review: J. Doyal, J. Spolar		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 15492'; Construction: 94% Easy, 2% Medium, 4% Difficult; # of >48" Culverts: 7; # of Bridges: 1; Ft. of Cross Slopes >55%: 621'; Ft. of Muskeg Crossing: 163'; # of "V" Notches: 4; Units Accessed: 4-units; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 3637'.</p> <p><u>Spurs:</u> None</p> <p><u>Comments:</u> Note that this road starts off with a bridge and then has several creek crossings. An alternate route was attempted from an existing USFS road to the northwest of unit 595-420. The alternate location was dropped due to a large and difficult "V" notch crossing.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Stream crossed by the road drains directly to a class I stream, consequently a fish timing window of July 18 to August 15 is necessary.			
Soils/Geology			Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8). During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "I"

MAIN ROAD #: 72-82-20.1		VCU: 595	TOTAL LENGTH: 7761 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 3 </u> - CLASS II: <u> 3 </u>			
<p>Engineering</p> <p>Field Review: J. Doyal, J. Spolar</p> <p>Office Review: J. Doyal</p> <p><u>Main Road:</u> Length: 7761'; Construction: 10X% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 6; # of Bridges: 0; Ft. of Cross Slopes >55%: 74'; Ft. of Muskeg Crossing: 1504'; # of "V" Notches: 1; Units Accessed: 595-422,433; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 548'. <u>Spurs:</u> None Comments: An alternate road was attempted that accessed the top of 595-422,433. It was abandoned because of difficult construction and creek crossings. This is an easy road to build. The critical grades noted are at 12%.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary.			
Soils/Geology		Comments by: T. Stewart	
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

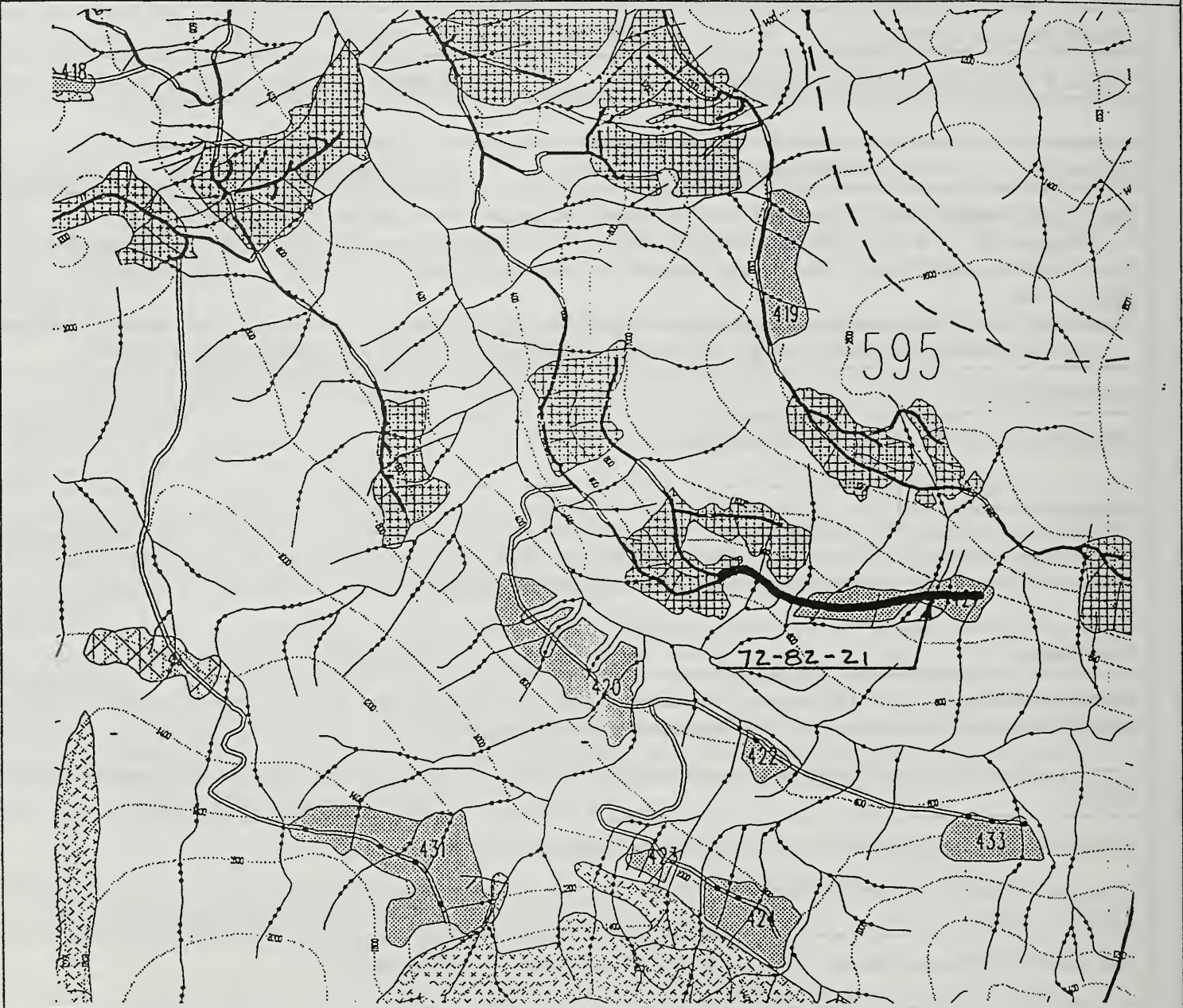
CONTROL LAKE PROJECT ROAD DESIGN CARD

"I"

ROAD : 72-82

VCU : 595

QUAD : C3NE/NW/SE/SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

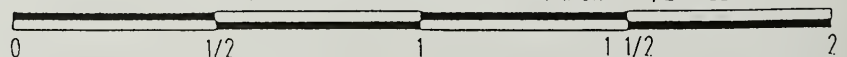
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 31, 1994

MapScale 1

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "I"

MAIN ROAD #: 72-82-21		VCU: 595	TOTAL LENGTH: 4400 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY:	
TOTAL # STREAM CROSSINGS - CLASS I: ____ 0 ____ - CLASS II: ____ 1 ____			
Engineering	Field Review: J. Doyal, E Dewilde		Office Review: J. Doyal
<p><u>Main Road:</u> Length: 4400'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 2; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 0'; # of "V" Notches: 0; Units Accessed: 595-421 # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 456'. <u>Spurs:</u> none Comments: This road will not access any timber further out the road, and is a good candidate for a temporary road.</p>			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
Road crosses a class II stream. No timing restrictions are necessary but culverts will be designed to allow fish passage during normal and low flows, and to minimize downstream scour (BMP 14.17).			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

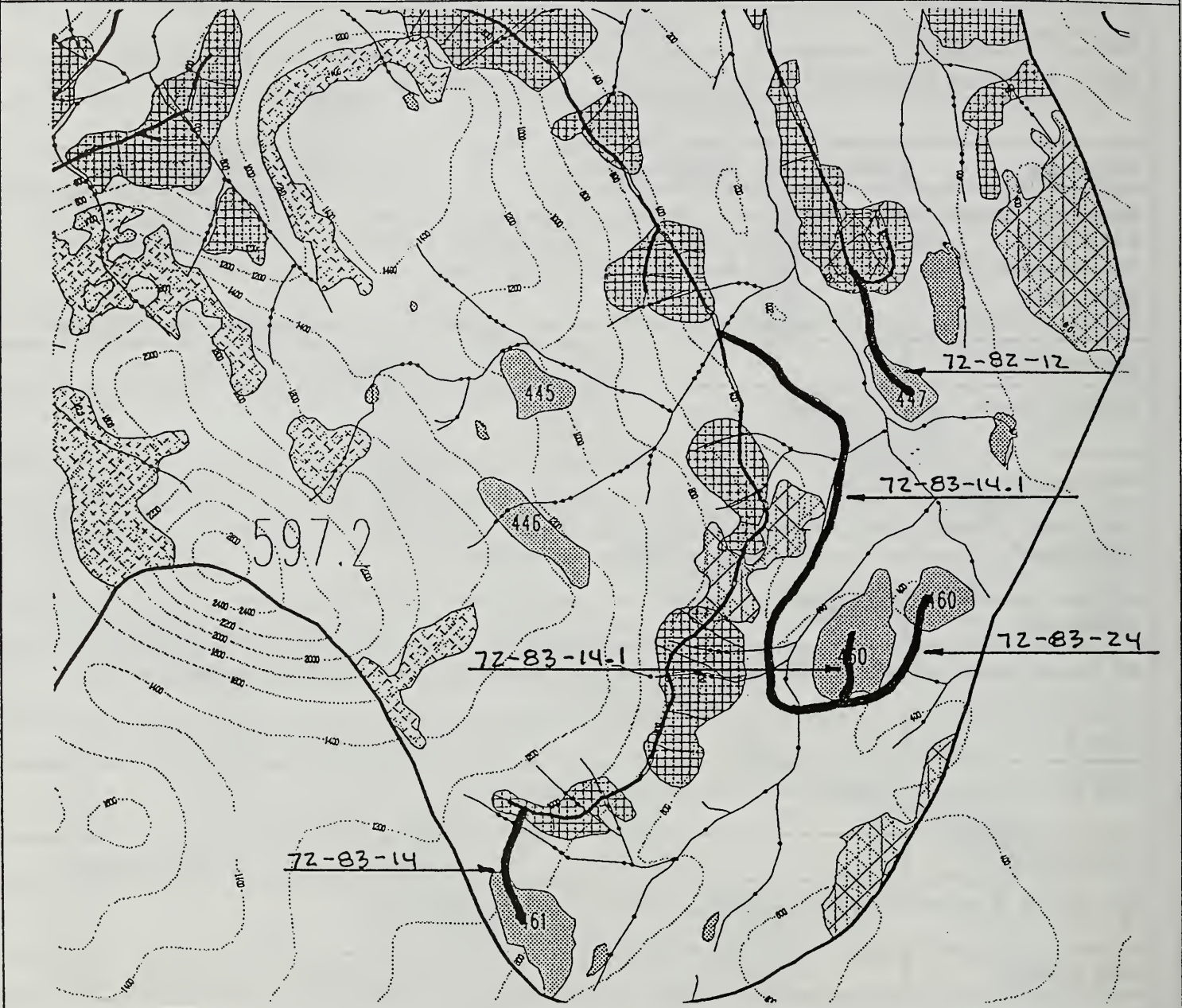
CONTROL LAKE PROJECT ROAD DESIGN CARD

"J"

ROAD : 72-83

VCU : 597.2

QUAD : C2NW/SW-C3NE/SE



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road

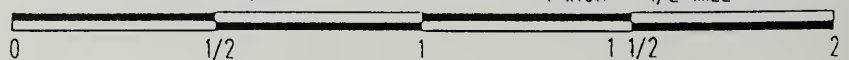
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet =

SCALE 1:31,680

1 INCH = 1/2 MILE



August 30, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

File: spurs-6

square: "J"

MAIN ROAD #: Existing USFS		VCU: 597	TOTAL LENGTH: 5126 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY:	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 0 </u> - CLASS II: <u> 0 </u>			
Engineering	Field Review: E. Urstadt, J. Graves		Office Review: K. Jehnke
<u>Main Road:</u> The main road is an existing USFS road. <u>Spurs:</u> Road #: 72-83-14, Length: 2491', Construction type: easy to medium (unit 597-461) Road #: 72-83-12, Length: 2635', Construction type: easy (unit 597-447) Comments: These are two short spurs which access good timber from an existing USFS road. The timber could be accessed very quickly and economically should the need arise. Neither has creek crossings or muskeg crossings.			
Timber/Silviculture			Comments by: J. Boyce
Maintain access for future silvicultural activities.			
Watershed/Fisheries			Comments by: J. Knutzen/T. Stewart
No special concerns.			
Soils/Geology			Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife			Comments by: C. Confer
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation			Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources			Comments by: W. Greiser/M. Greenig
Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.			

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "J"

MAIN ROAD #: 72-83-14.1		VCU: 597	TOTAL LENGTH: 13023 FEET
ROAD CLASS: local		SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1		ACCESS STRATEGY: Accept	
TOTAL # STREAM CROSSINGS - CLASS I: <u>4</u> - CLASS II: <u>1</u>			
Engineering			
Field Review: J. Doyal, T. Hoshal		Office Review: E. Urstadt	
<p><u>Main Road:</u> Length: 10073'; Construction: 100% Easy, 0% Medium, 0% Difficult; # of >48" Culverts: 1; # of Bridges: 0; Ft. of Cross Slopes >55%: 0'; Ft. of Muskeg Crossing: 1680'; # of "V" Notches: 0; Units Accessed: 597-460; # of Quarry Sites: 0; # of Switchbacks: 0; Ft. of Critical Grades: 385'. <u>Spurs:</u> Road #: 72-83-24, Length: 2950', Construction type: easy (unit 597-460) Comments: The average side slope is 25%. Rock quarries were not noticed along the road, but quarries do exist on USFS 3013220.</p>			
Timber/Silviculture		Comments by: J. Boyce	
Maintain access for future silvicultural activities.			
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart	
Class I stream crossing requires a construction timing window of July 18 to August 15. Stream crossed by the road drains directly to a class I stream, consequently a similar fish timing window of July 18 to August 15 is necessary. Segment to unit 597-460 crosses stream with a floodplain which requires placement of culverts on each side of stream to pass flood flows.			
Soils/Geology		Comments by: T. Stewart	
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).			
Wildlife		Comments by: C. Confer	
Road does not approach within 1/2 mile of any known bald eagle nest sites.			
Visual/Recreation		Comments by: R. Suttle/M. Greenig	
This segment of the road will not be visible from a Priority Travel Route/Use Area.			
Other Resources		Comments by: W. Greiser/M. Greenig	
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>			

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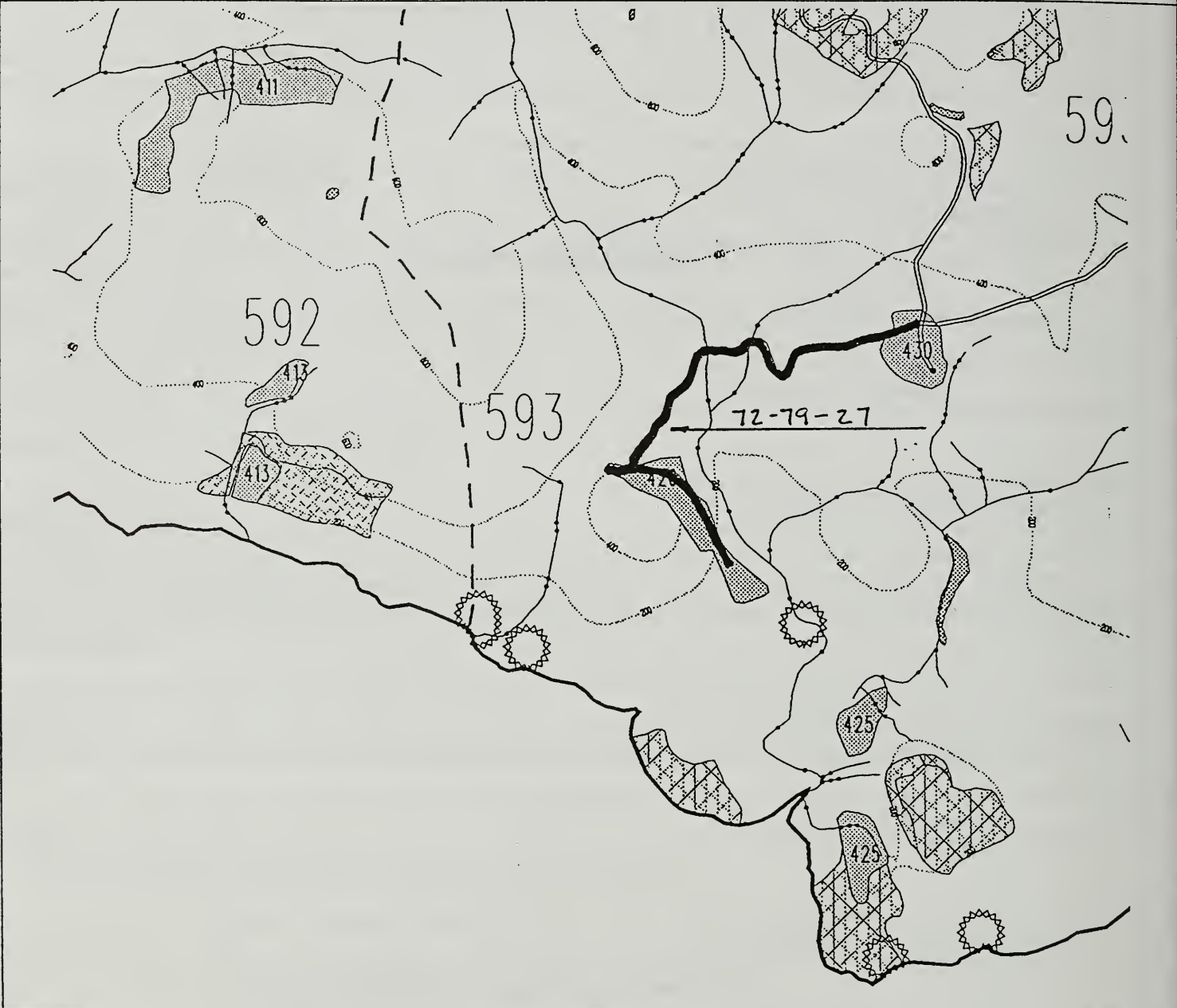
CONTROL LAKE PROJECT ROAD DESIGN CARD

"K"

ROAD : 72-79

VCU : 592/593

QUAD : C4SW



- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 30, 1994

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "K"

MAIN ROAD #: 72-79-27	VCU: 593	TOTAL LENGTH: 7886 FEET
ROAD CLASS: local	SERVICE LEVEL: D	
MAINTENANCE LEVEL: 1	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u>2</u> - CLASS II: <u>0</u>		
Engineering	Field Review: E. Dewilde, D. Keister	Office Review: J. Doyal
<p><u>Main Road:</u> Length: 7886'; Construction: 97% Easy, 3% Medium, 0% Difficult; # of >48" Culverts: 0; # of Bridges: 1; Ft. of Cross Slopes >55%: 239'; Ft. of Muskeg Crossing: 364'; # of "V" Notches: 0; Units Accessed: 593-426; # of Quarry Sites: 0; # of Switchbacks: 2; Ft. of Critical Grades: 246'. <u>Spurs:</u> None Comments: An alternate road was attempted from the west as drawn in the paper plan. The units on that road were dropped due to lack of timber, thus making that road location impractical. The present road location was determined to be much more economical than the paper plan location. However, the present location has its own problems. The road is long with difficult construction, and it accesses only one unit. The bridge crossing is the only feasible crossing in the area. The economics are poor; consider helicopter logging 593-426.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
Class I stream crossing requires a construction timing window of July 18 to August 15. Segment crosses two streams with a floodplain which requires placement of culverts on each side of stream to pass flood flows.		
Soils/Geology		Comments by: T. Stewart
Oversteepened slopes require full bench construction and end haul of waste (BMP 14.7). Class I stream crossing requires a construction timing window of July 18 to August 15. During bridge installation, erodible material will not be deposited in live streams and sediment laden water pumped away from foundation excavation will be pumped to settling areas identified during final design (BMP 14.17).		
Wildlife		Comments by: C. Confer
Portion of road is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
This segment of the road will not be visible from a Priority Travel Route/Use Area.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources. Lands - No state/private encumbered lands occur adjacent to the road.</p>		

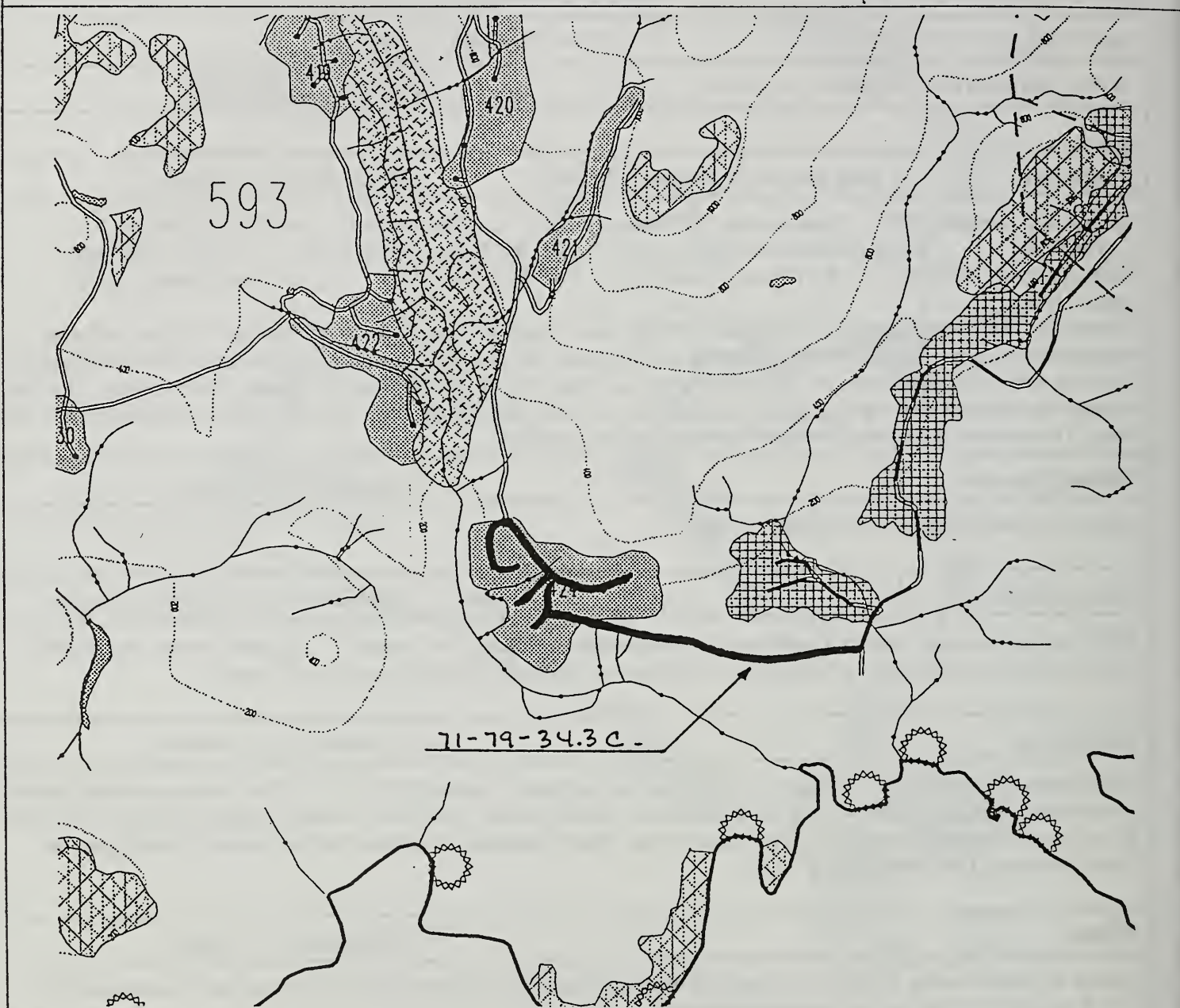
CONTROL LAKE PROJECT ROAD DESIGN CARD

"L"

ROAD : 71-79

VCU : 593

QUAD : C4SW



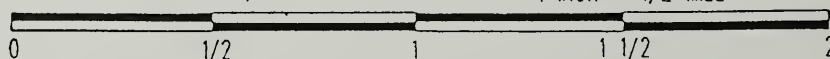
- Revised Control Lake Project Boundary
- Unit Boundary
- Eagle Tree Buffer of 330ft
- VCU Boundary
- Existing & Rebuilt Roads
- Proposed Roads
- Subject Road
- Class 1 Stream
- Class 2 Stream
- Class 3 Stream

- Lakes, Ponds, Ocean
- Second Growth
- MMI 4
- McGilvery > 41%
- Units
- Landing

Contour Interval 200 feet

SCALE 1:31,680

1 INCH = 1/2 MILE



August 30, 1994

Map 0

CONTROL LAKE PROJECT ROAD DESIGN CARD

square: "L"

MAIN ROAD #: 71-79-34.3C	VCU: 593	TOTAL LENGTH: 6795 FEET
ROAD CLASS: local, collector	SERVICE LEVEL: C,D	
MAINTENANCE LEVEL: 1	ACCESS STRATEGY: Prohibit	
TOTAL # STREAM CROSSINGS - CLASS I: <u> 1 </u> - CLASS II: <u> 0 </u>		
Engineering	Field Review: E. Urstadt, M. Hoshal	Office Review: J. Doyal
<p><u>Main Road:</u> The main road connects a long road system to Sealaska roads.</p> <p><u>Spurs:</u> Road #: 71-79-34.3A, Length: 1345', Construction type: easy (unit 593-424)</p> <p>Road #: 71-79-34.3B, Length: 450', Construction type: easy (unit 593-424)</p> <p>Road #: 71-79-34.3C, Length: 5000', Construction type: medium (unit 593-424)</p> <p>Comments: The main road was originally designed as a short spur for unit 593-424. 4100' of the 5000' is only needed to connect to Sealaska roads. This road is part of a road loop that will be analyzed for final haul direction. (See 71-79-34.3). This road segment is not part of any EIS alternative.</p>		
Timber/Silviculture		Comments by: J. Boyce
Maintain access for future silvicultural activities.		
Watershed/Fisheries		Comments by: J. Knutzen/T. Stewart
No special concerns.		
Soils/Geology		Comments by: T. Stewart
All areas of organic and mineral soil exposed during construction shall be grass seeded and fertilized (BMP 14.8).		
Wildlife		Comments by: C. Confer
Beginning of road segment is within 1/2 mile of a potential bald eagle nest site. If active, follow the interagency agreement with U.S. Fish and Wildlife Service during construction.		
Visual/Recreation		Comments by: R. Suttle/M. Greenig
Within "West Coast Waterway" Viewshed. Maximum Modification VQO. Middleground Distance Zone.		
Other Resources		Comments by: W. Greiser/M. Greenig
<p>Cultural - Road is outside of high probability areas for cultural resources.</p> <p>Lands - No state/private encumbered lands occur adjacent to the road.</p>		



Appendix H

Integrated Silvicultural Prescription Example

INTEGRATED SILVICULTURAL PRESCRIPTION
FOR THE CONTROL LAKE TIMBER SALE
(Based on the Control Lake FEIS 1995)

VCU #: 596 Unit #: 402 Management Area #: K 15

Area: 24.6 acres (GIS)

Aerial Photo Flight Line #: 990 Photo #: 93 Date of Photography: 1991

Scale of Photography: 1:12,000

USGS 1/4 Quadrangle ID: CRG C3 NW

SITE CHARACTERISTICS (based on field verification unless noted):

Aspect: SW Slope: 40-100% Elevation: 1200' to 1900'

Landform: Hillslope

Plant Association Codes: 390 (2 plots), 410 (2 plots), 430 (1 plot), 510 (1 plot)

Soils (GIS): 53CFX, 220C, 351DE

Site Class (50 year base, GIS): 1 (3.6 AC) 3 (.8 AC) 4 (20.2 AC)

Potential of Mass Failure: Moderate

STAND CHARACTERISTICS:

Stand Examination Type: Quick Plot (type 11), 40 BAF

Date: 7/6/93

	SAMPLE TREES		AVE	STAND SUMMARY					
				BASAL	REL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	AREA	DEN	BF	BF	CUBIC	CUBIC
MT.HEM	32	2428.3	3.8	194.4	99	15406	14269	5894	5532
AL YEL C	9	109.9	9.1	49.2	16	3035	2870	1392	1274
SITKA SP	13	516.4	4.6	60.0	28	13600	13600	2870	2870
WHEMLOCK	8	105.7	9.6	52.8	17	5969	5799	1526	1526
<hr/>									
TOTAL	62	3160.4	4.5	356.5	167	38010	36538	11681	11202

STAND DESCRIPTION AND HISTORY:

This is a 90' to 180' tall multi-storied old-growth stand composed of mostly Sitka spruce, western hemlock, mountain hemlock, and yellowcedar tree species. Natural regeneration is predominantly small Sitka spruce, mountain hemlock, and yellowcedar seedlings. Advanced regeneration is sparse but acceptable for future crop trees.

Dense salmonberry and devil's club understory vegetation in most areas. Mistletoe is light in the overstory. Windthrow damage is not evident in stand. Topography includes steep slopes up to 100%. Numerous muskegs below unit. Northeastern unit boundary was modified to exclude unstable slopes. There have been past timber management activities about 1 mile south of the unit.

Plant Associations and Management Implications:

From DeMeo, *et al.* 1992. Forest Plant Association Management Guide. Ketchikan Area, Tongass National Forest. R10-MB-210.

410 Mixed Conifer/Blueberry

Timber Productivity: Low, vol class 4
Rotation Length: 300 years
Logging Systems: Shovel yard may be an option on slopes up to 20%.
Regeneration: Very slow growth, cedar planting not recommended. Retain advanced regeneration if feasible.
Wildlife Values: Valuable forage for Sitka black-tailed deer. Low thermal cover value due to open canopy.

430 Mixed Conifer/Blueberry/Deer Cabbage

Timber Productivity: Low, vol class 4
Rotation Length: Slow growth, this is a wetland association.
Logging Systems: No shovel, poor drainage.
Regeneration: No planting, selective harvest
Wildlife Values: Moderate spring but valuable summer and fall habitat for deer. Poor thermal cover.

390 Sitka Spruce-Mountain Hemlock/Blueberry

Timber Productivity: Moderate, vol class 7.
Rotation Length: Generally 100 years.
Logging Systems: Cable for log suspension.
Regeneration: Rely on advanced regeneration if feasible since conifer response at these higher elevation cold sites may be delayed.
Wildlife Values: Value for deer summer range is high.

510 Mountain Hemlock/Blueberry

Timber Productivity: Moderate, vol class 5.
Rotation Length: Generally 100 years.
Logging Systems: Cable with suspension to protect advanced regeneration.
Regeneration: Slow response of mountain hemlock and yellowcedar with planting not recommended.
Wildlife Values: Valuable summer deer range.

SUMMARY OF OTHER RESOURCES AND VALUES:

The unit lies within the Honker Divide Watershed landscape zone as described in the Control Lake FEIS. This area is outside any proposed old-growth blocks or late-successional

corridors. Maximum Modification VQO. A Class III stream occurring along the western boundary requires directional falling and split yarding. Wetlands or borderline wetland conditions are present and may require special protective measures such as partial log suspension.

MANAGEMENT DIRECTION:

This area has been allocated through the Tongass Land Management Plan (1979, as amended) to Land Use Designation (LUD) 4. Opportunities will be provided for intensive resource development where emphasis is primarily on commodity or market resources, while providing protection of physical and biological productivity.

This area has been allocated by the proposed revised forest plan (TLMP Draft Revision 1991) to a LUD of Scenic Viewshed. The emphasis of this land use designation is to provide scenic landscapes, vistas, and travel corridors in areas viewed from roads used primarily for recreational driving, trails, major marine travel routes, recreation sites and popular bays and anchorages where forest visitors have high expectations for scenic quality. Management activities in the visual foreground are not evident to the casual observer and are subordinate to the characteristic landscape in the middleground and background views. Timber harvest activities are typically small and affect only a small percentage of a viewshed. However, this harvest unit is not seen so the resulting VQO is Maximum Modification. The projected rotation period is approximately 170 years.

UNIT OBJECTIVES:

- Provide volume to the KPC long term timber sale or Ketchikan independent sale program.
- The above management direction, together with the proposed landscape zone for this area, would emphasize timber production. However, regeneration concerns exist due to steep slopes, shallow rocky soils, higher elevation snow damage, and salmonberry competition. The desired future condition of this unit is a multi-storied stand of mixed species and sizes which will yield sawlog size and quality products through the rotation period. Minimize loss of volume due to blowdown. Reduce prevalence of mistletoe and other pathogens in area and minimize risk of infecting regeneration. Protect soil productivity, wetlands and fisheries resources. Achieve partial suspension where slopes are >50%. Use least expensive logging systems that adequately protect resources. Maintain safety of logging personnel.

MANAGEMENT PRESCRIPTION:

Silvicultural treatment:	Type G - Shelterwood, Type A - Clearcut (see Control Lake FEIS)
Logging System:	Running Skyline (partial suspension required on slopes >50%)
Transportation System:	Unit accessed by road number 71-82-15.1

Treatment:

Setting B: Type G - Shelterwood. Shelterwood with reserves is the most effective treatment that retains some of the canopy in an attempt to improve regeneration success. Clearcutting with reserves was considered but this did not meet the above objectives sufficiently. Remove 70% of the unit volume cutting mistletoe and disease infected trees from all diameter classes and canopy levels. Leave all spruce and cedar where possible to help maintain presence of these species and reduce windthrow (cedar). Retain some larger crowned trees to help intercept snow and protect regeneration. Reserve trees will be managed with the resulting secondgrowth to provide structure so old-growth characteristics will be obtained sooner. Poorly formed or unmerchantable trees could compose a large proportion of the residual overstory to meet structural objectives. However, poorly formed or leaning trees are at higher risk to blowdown. Leave trees should ideally be straight, sound, and have high taper (height/diameter ratio of <100) for maximum windfirmness. Retain sufficient well-formed dominants and codominants to maintain stand windfirmness, provide possible genetically desirable seed source for regeneration, and to provide merchantable volume for possible future entries. Carefully fall and yard trees toward lateral yarding system to minimize damage to the residual stand. Spacing and leave tree selection should consider these felling and yarding requirements. Partial suspension of logs is required on steeper slopes ($>50\%$) and is obtainable over most of the unit. Retain safe snags and large down woody material where possible.

Setting A: Type A - Clearcut. This area was not feasible for partial cutting due to downhill yarding. Clearcut retaining safe snags and large down woody material where possible. Leave unmerchantable, mistletoe-free trees within a 50 to 100 foot border along the harvest unit edges and internal setting boundaries. Fall trees directionally toward the landing and carefully yard trees out of these areas. Partial suspension of logs is required on steeper slopes ($>50\%$) and is obtainable over most of the unit.

Regeneration:

Regeneration concerns exist due to high elevation and low site productivity. The probability of successful reforestation meeting NFMA guidelines is high if supplemental measures such as canopy retention and/or protection of existing regeneration are used. Suspension will help reduce soil scarification and damage to poorly drained soils, and help avoid creating conditions that increase brush competition. Planting is expensive and may not be very successful in these plant associations. Monitor to ensure proper timing of regeneration and possible need for release from brush competition.

Low productivity may delay successful regeneration for many years. Both tree seedlings and understory species should slowly become established from seed and/or resprouting. Natural regeneration of hemlock is planned based on these plant associations. Yellowcedar and spruce will likely be minor components. Yellowcedar is anticipated to restock wetter areas while spruce will be confined to areas where sufficient soil disturbance has taken place.

Stand Development and Intermediate Treatment Opportunities:

Setting B: Leaving an overstory will likely delay full site occupancy and crown closure from 5 to 10 years depending on stand density and the availability of light reaching the understory. low site productivity will likely delay full site occupancy and crown closure for many years. At approximately age 20-30, the lower canopy levels will be closed or nearly closed and competition between young trees will increase. Understory biomass will quickly decrease due to shading. Precommercial thinning from below is recommended at this time to allocate growth to crop trees and to prolong the presence of understory vegetation. Preferentially leave the best formed spruce and cedar regeneration at approximately 300 trees per acre (12'x12' spacing). These trees are expected to grow slowly in the shade of the overstory but should provide merchantable trees by the end of the rotation.

Setting A: Brush competition will likely delay full site occupancy and crown closure for several years in these plant associations. Precommercial thinning is recommended about age 25 to allocate growth to crop trees to prolong the period of forage availability. Preferentially leave the best formed spruce and yellowcedar at approximately 300 trees per acre (12'x12' spacing). Closer spacing (5'x5') should be used in areas with a very high redcedar or yellowcedar component to reduce bole taper in these species. Wider spacing (16'x16') in conjunction with pruning may be desirable for enhanced radial growth and wood quality of spruce and hemlock.

Commercial thinning is unlikely due to operational constraints such as downhill yarding, long yarding distances, or broken topography creating logging feasibility problems. Commercial thinning opportunities also are unlikely due to delayed regeneration and low productivity of these plant associations.

Setting A: By the end of the 170 year rotation, the clearcut areas will have a single-storied, relatively open canopy composed of smaller sawtimber size crop trees with some advanced regeneration and considerable understory vegetation. Some blowdown will have occurred that created canopy gaps having increased understory vegetation and tree regeneration. Structural diversity objectives should have also been met throughout the rotation period by the unmerchantable trees left during the initial entry.

Setting B: Shelterwood areas will have a multi-storied canopy composed of all diameter classes with little understory vegetation. Larger overstory trees remaining after the initial entry could be harvested later only if sufficient intermediates grew to a more dominant position in the canopy and contributed larger structure. This may not occur during the rotation period if growth of intermediates is too slow due to shade and the residual overstory must be carried to full rotation length. This management strategy differs from traditional uneven-aged management because it is less intensive, only has 1-2 entries, and specific diameter class distributions are not maintained. It also differs from a more traditional shelterwood system where the second entry removes remaining overstory trees after young regeneration has become well established. The system proposed here is most similar to traditional shelterwoods except it focuses on the growth of intermediate trees instead of new

regeneration, deals with multi-storied instead of typically two-storied stands at the time of a second entry, and requires a longer time period between entries. The second commercial entry is delayed until sufficient intermediate trees grow large enough to contribute larger structure and can functionally replace the removed overstory trees. This may not occur until the end of the rotation period. Growth and differentiation of regeneration and intermediates could be increased if the remaining overstory trees are removed during a second entry, but sufficient structure may not exist for the period of time required for intermediates to release and reach larger size. Precommercial thinning of regeneration could also speed up this process by allocating growth early in the rotation to future intermediates and (ultimately) dominants.

Concerns and Potential Effects:

Setting A: Regeneration may be delayed by possible salmonberry competition with seedlings and by possible snow damage at the higher elevations. Mass movement potential is relatively high due to steep slopes and subsurface water flowing through soil. Hand planting of spruce, redcedar and/or yellowcedar may be necessary to maintain or increase this species presence in the stand. Reserve trees and/or stream (lake) buffer may be subject to windthrow. Regeneration and stand development may be very slow due to low site productivity.

Setting B: Hand planting of spruce and/or cedar may be necessary to maintain or increase these species presence and competitiveness in the shaded understory. Some windthrow may be anticipated in reserve trees. Residual trees may sustain logging damage and subsequently develop fungal pathogens. Opportunities may be limited for a second entry to remove residual overstory trees if insufficient structure has developed from released intermediate trees. Unmerchantable trees left during the initial entry should be carefully considered for their likelihood of conversion into snags, and reevaluated at the time of precommercial thinning for their possible impediment to young regeneration and intermediates developing into dominants over the rotation period. Stream buffer may be subject to windthrow.

Summary of mitigation measures (see Control Lake FEIS):
F1; F3; F6; F8; W2 (south 1/2); W5 (north 1/2).

MONITORING PLAN:

Person Responsible: Ranger District Silviculturist

Setting A: Long-term monitoring should include all the items listed in the Ketchikan Area Monitoring Plan for implementation monitoring. Consider unit for effectiveness/validation monitoring as well, especially for the success of clearcut with reserves in maintaining structural diversity throughout the rotation. Natural regeneration exam should be scheduled for the 3rd year after harvest, with attention to determining if planting is required, or if existing regeneration needs release from overtopping brush such as salmonberry. A certification of regeneration is planned for age 4-6. Survey for precommercial thinning

opportunities 19 to 20 years after harvest to determine optimum treatment timing (or earlier if wildlife forage availability is the primary concern).

Setting B: Shelterwood areas must be monitored under the Regional Administrative Study or Research Outline (FSH 2409.17). Long-term monitoring should include all the items listed in the Ketchikan Area Monitoring Plan for implementation monitoring. Consider unit for effectiveness/validation monitoring as well, especially for the success of shelterwood with reserves in maintaining structural diversity throughout the rotation; for promoting regeneration; for maintaining windfirmness; and for effective pathogen reduction. Stocking surveys should be scheduled for the 3rd year after harvest, with a certification of regeneration planned for age 4-6. Survey for precommercial thinning opportunities 19 to 20 years after harvest to determine optimum treatment timing.

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